THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. XC. No. 2194.] LONDON, MAY 30, 1905. [57TH YEAR. PRICE 6d.

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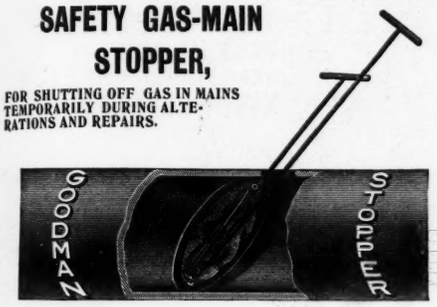

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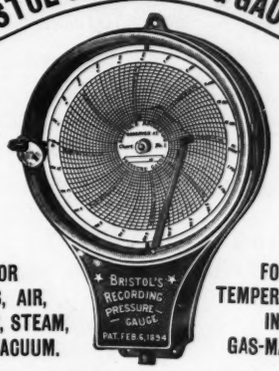

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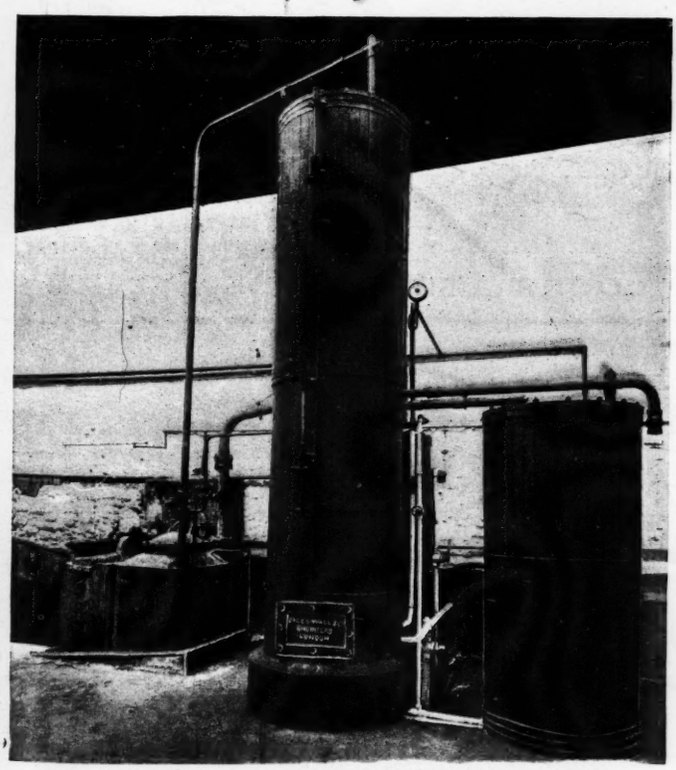

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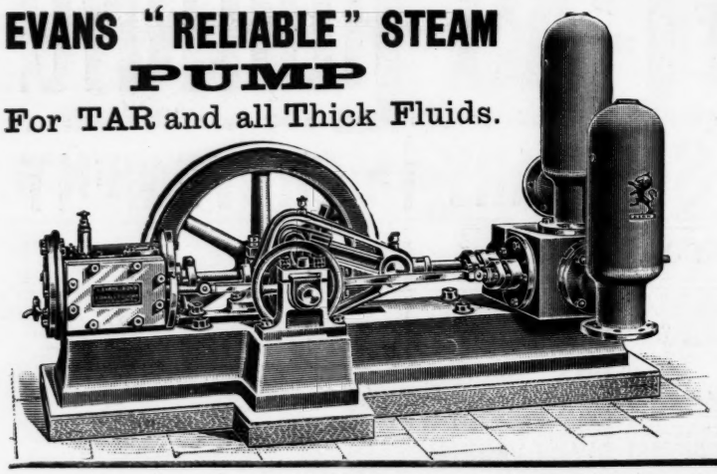

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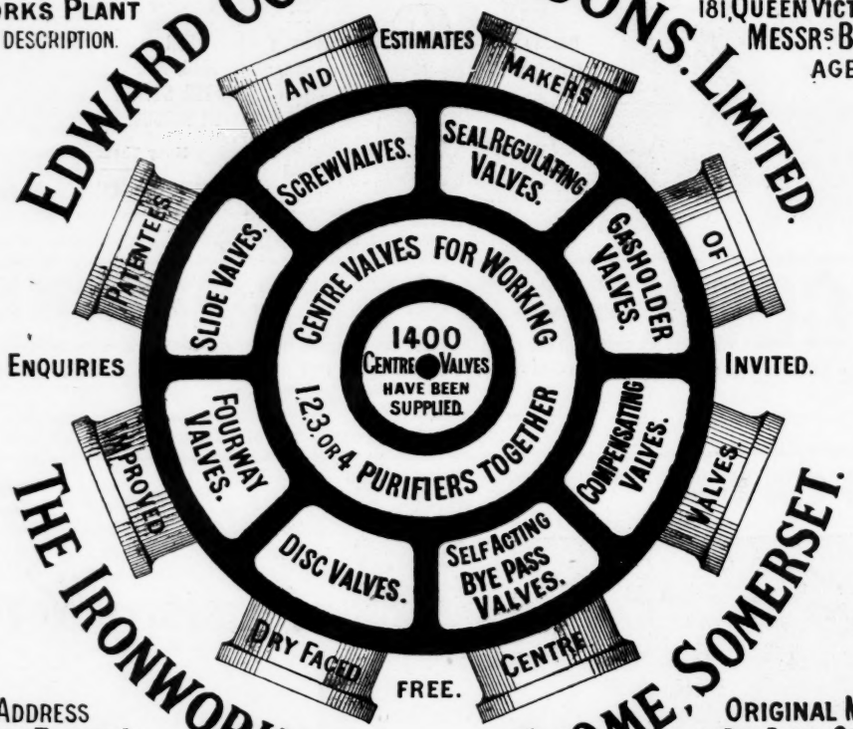

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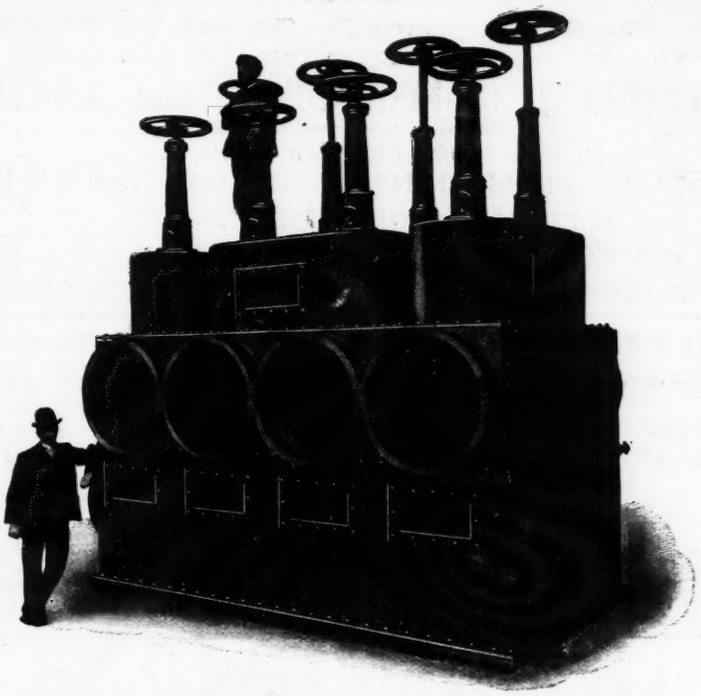

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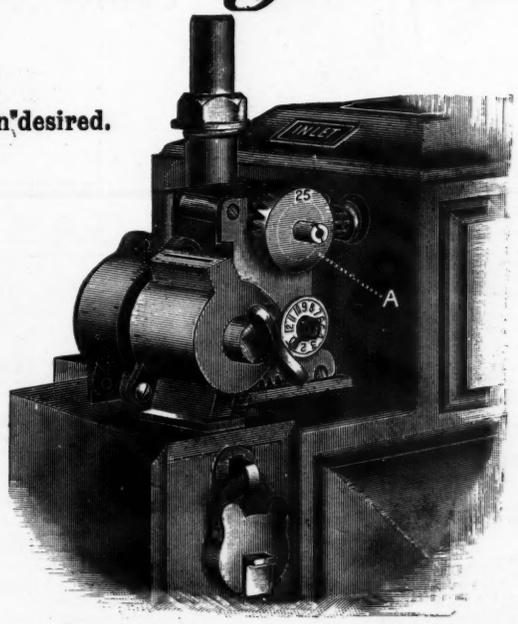

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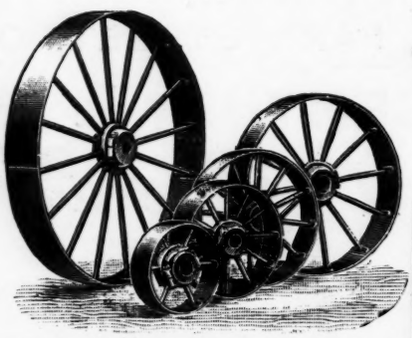

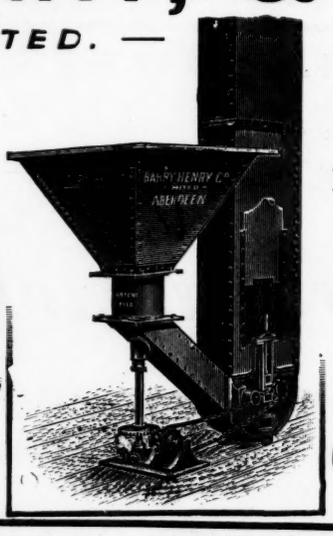

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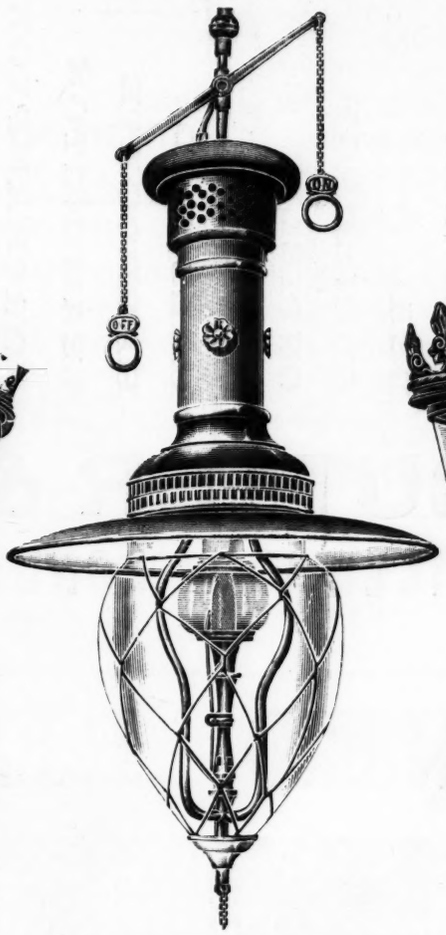

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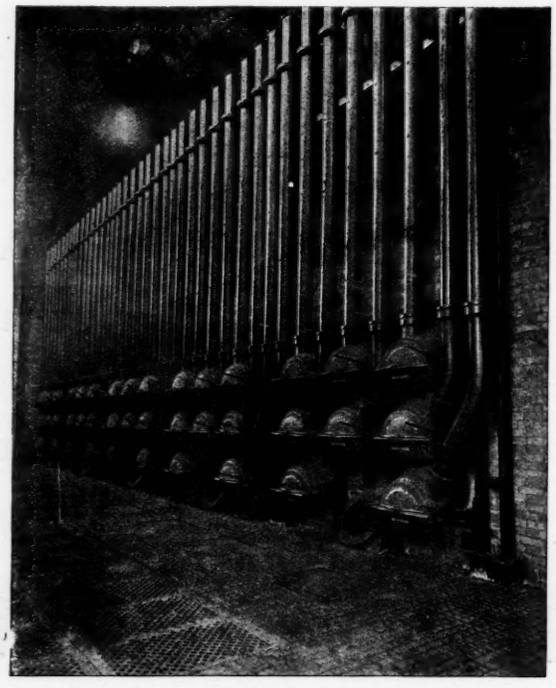

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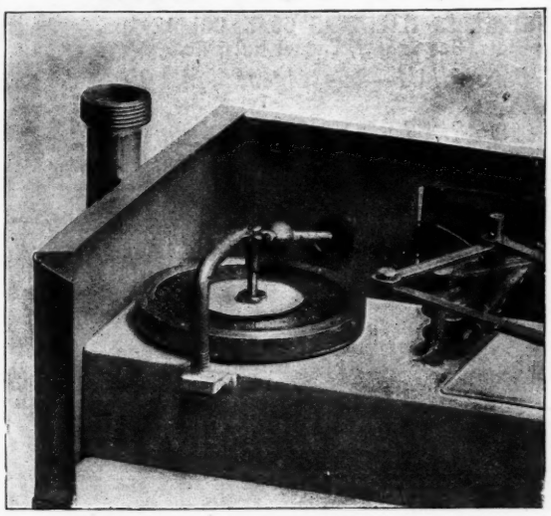

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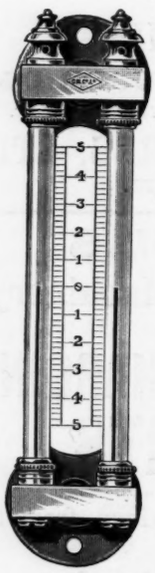

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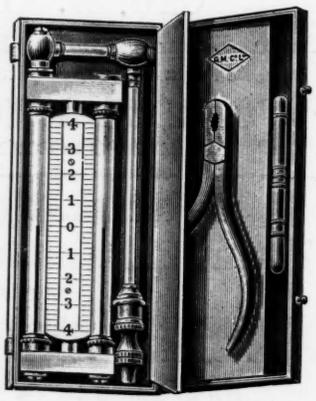

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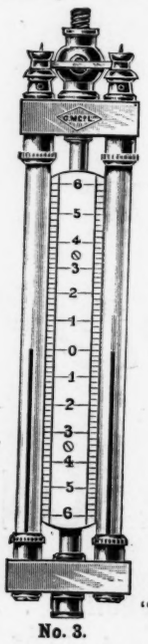

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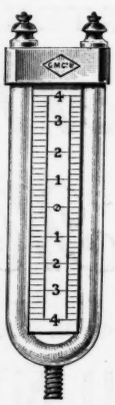

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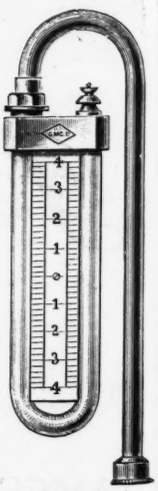

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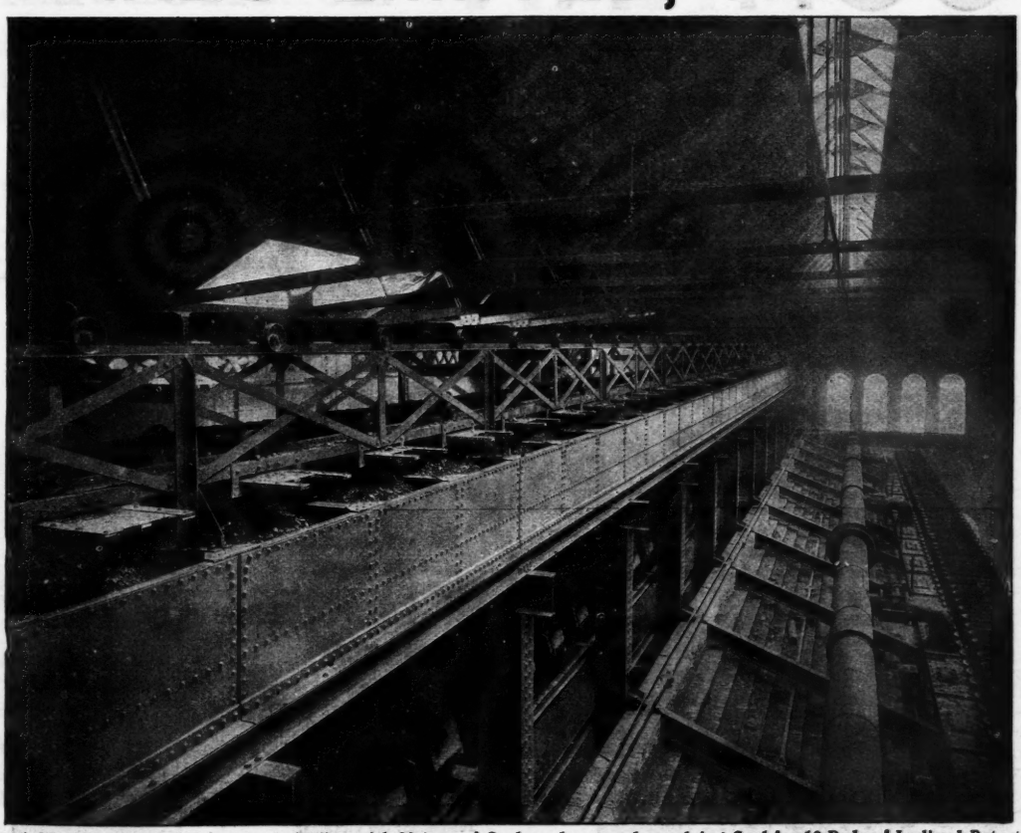

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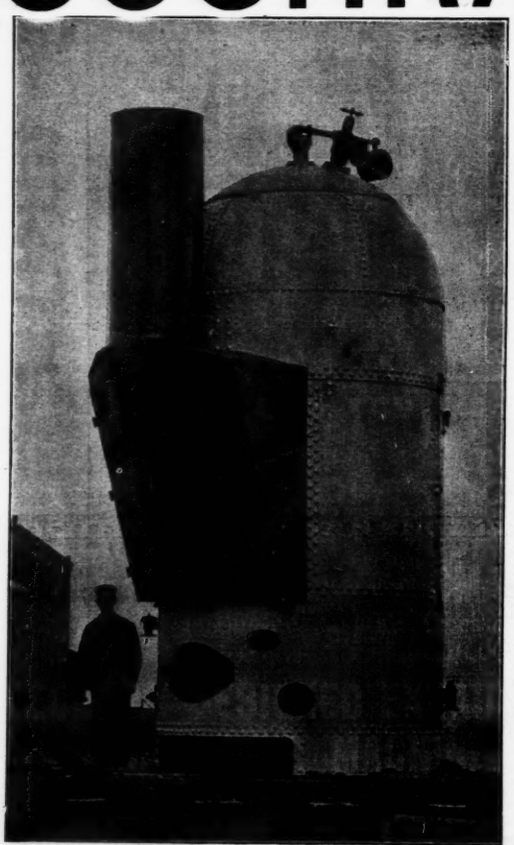

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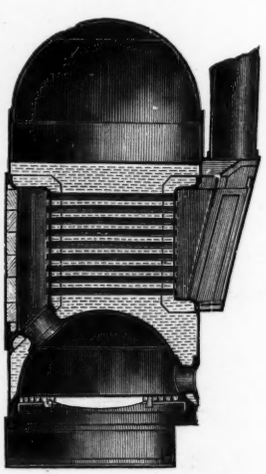

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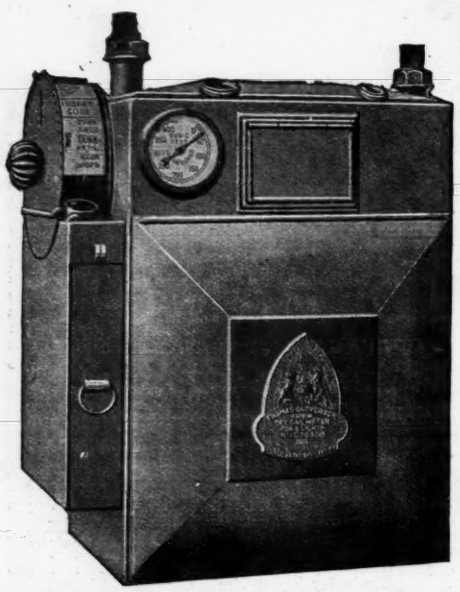

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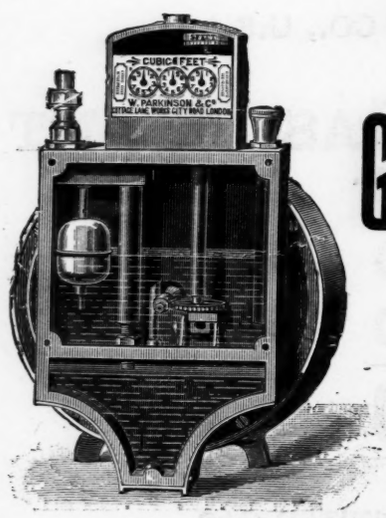

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EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON.

VOL. XC., No. 2194.—TUESDAY, MAY 30, 1905.

EDITORIAL NOTES—GAS, &c.

In Parliament.

Two events of the week relating to gas legislation require brief notice; and they both refer to actions one of which threaten to be, and the other is, destructive to gas-supply interests in important degrees. The first event is the presentation of a petition, on behalf of the Institution of Gas Engineers, to the Committee of the House of Lords who are to consider the London (County Council) Gas Bill on the subject of the gas-testing clause; and the second is the reversal, by the same Committee of the Lords, of the decision of a House of Commons Committee not to impose upon the Hitchin Gas Company a purchase clause, to which local authorities consider they have a prescriptive right when non-statutory companies approach Parliament. But the two questions are so distinct in character that, while their Lordships' decision in the Hitchin case will be widely pronounced an erroneous one, it cannot be looked upon as ominous for the endeavour that is now being made for the removal of the injustice which the London Gas Bill purposes to put upon gas suppliers in the form of an "unscientific and unjustifiable" illuminating power test. The Committee ought not to have any difficulty in finding that the representative character and strength of the case which will be put before them on this gas-testing question will supply them with greater reason for reversing the decision of a Commons Committee than can possibly be discovered for their action in connection with the Hitchin Bill.

The prompt measures of the Council of the Institution in support of the steps taken to rectify the blunder made by the Departmental Committee of the Board of Trade will commend themselves to all who really have at heart the interests of the gas industry. There was, in view of the near approach of the consideration of the Bill, no time to lose in advancing their protest and support by means of a petition. It is the first time that the Institution have taken such bold action as appealing direct to Parliament; and we hope, if the occasion requires, it will not be the last. Their course of action in this respect has undoubtedly the direct approval of the Board of Trade. As was pointed out, in alluding to the report of the Council last week, the Board themselves referred the Council to Parliament when they wrote: "The decision of the question at issue rests with "Parliament, and not with the Board of Trade; and it is "competent for the Gas Companies affected by the London "Gas Bill to bring all the evidence at their disposal before "the Committee of the House of Lords." Who are the Gas Companies affected? They are not only the Metropolitan ones, but the several in whose Bills to-day stand clauses which commit them to the method of testing that is imposed upon the London Companies. They are included in the Companies immediately concerned; and we think it a pity that they did not join forces to try to obtain *locus standi* in respect of this London Bill on the point of testing. Besides those companies who are directly affected, the future interests of the whole gas industry are likewise attacked. Therefore, the Council of the Institution are, as the head of the leading gas organization of the kingdom, taking a rightful course and their rightful position in doing their part in safeguarding those interests. We cannot say more than has been said about the iniquitous and absurd nature of the test prescribed by the London Gas Bill; and we can only hope the endeavour that has been made to rescue the gas industry from the threatened danger will now be quickly successful.

Concerning the second event, there will be general regret among gas companies—and especially non-statutory ones—that the Hitchin Gas Company have not been successful in evading the insertion of a purchase clause in their Bill. The case of the Company was in every particular just as strong as that submitted in the Lower House; and among those who presented it were Mr. A. F. Phillips, Mr. Corbet Woodall, and Mr. E. L. Burton. But apparently their Lordships felt themselves tied to custom. We should like to read a carefully indited defence of that custom by any gas engineer. In this case, Mr. H. E. Jones gave evidence on behalf of the District Council; and on the same side was Mr. Charles Hunt, but he was not called. Mr. Jones stated distinctly that he hung the whole case for purchase upon the fact that the Company had used money for capital purposes which, in his view, belonged to the consumers. One of the articles of Mr. Jones's professional creed which he has frequently recited in public, and always practised in private, has been that a low capital account is an important factor in serving the interests of the consumer. Hitchin is not a rich district for gas supply; and the whole of a small non-statutory Company's circumstances serving such a district must be considered. The consumers of the district are now enjoying, and under the Company's management would in the future continue to enjoy, the past providence of the Company. If the "whole case" for purchase was as stated by Mr. Jones, it could not assuredly have had much weight with the Committee. It comes to this: Will the gas consumers of Hitchin, if the Council exercise their power of purchase, be any the better off under their management than under a Company whose administration has been engrained with frugality? We think not. There will be capital to repay, interest to meet, and a Council hungering for profits in a district the profits from which must have a fairly sharp limit. Mr. Jones's attitude was that of one who would (ignoring the future of the consumers) punish the Company for what he regarded as a piece of delinquency on their part. But with the same Company under statutory regulation, what does he say then—company or municipal management? Mr. Jones was sitting on a rickety fence in this matter; and his "whole case for purchase" could better have been used for restricting this wicked Company. However, it seems plain that it was not Mr. Jones, but that old obstructionist Custom, who has again scored.

A Joint Statement on the Milan Case.

IT is with the utmost pleasure that we give in this issue the fullest possible prominence to the communication jointly made to us for publication by Messrs. Spyer and Sons and Messrs. Waterhouse and Co., the Solicitors respectively of Messrs. Graham, Morton, and Co., Limited, and L'Union des Gaz, which communication closes, as between the two parties to the recent action, all questions of public interest in respect of the inclined-retort contract at Milan. Admittedly, as the letter states the matter, the main issue raised in the action was as to whether the work of the plaintiffs was well or ill done—that is to say, whether they had fulfilled their contract, and whether their design was good or the reverse; but the defence of the action and the counterclaim likewise presumed misconduct and negligence on the part of the contractors in fulfilling the obligations they had entered into, and therefore impeached their honour. It is impossible to separate the main issues from those which are involved by them, as a decision against the plaintiffs on the main issues would have practically meant the overthrow of their reputation so far as the gas industry was concerned. Those are matters, however, that it is unnecessary to further discuss, seeing that the plaintiffs left Mr. Justice Grantham's Court completely exonerated; and the statement signed by the Solicitors to the defendants (as well as by the Solicitors to the plaintiffs) declares that "the decision is now unreservedly accepted." The announcement is significant and emphatic; and, while it removes Messrs. Graham, Morton, and Co. from further association with the matter, it raises in mind the events antecedent to the lawsuit and broader questions affecting the administration of public companies. The former are matters that now rest between the shareholders and the

Board. The latter are questions which, as a journal devoted to public and special interests, come within our province to discuss; but it would ill become us to further animadvert upon them at the present juncture, and we sincerely hope, so far as the Continental Union Gas Company are concerned, that—perhaps through re-organization in some form—the occasion may never arise. The case must, unless we much misjudge the Directors (whom we have always held in the highest esteem for their individual qualities, and with whom we have ever had the most pleasant relations in our respective positions in the gas industry), have opened their eyes to many matters which should prove of supreme advantage to the Company in the future. The present Board have had certain undesirable legacies and many difficulties to contend with; and no man has been more self-sacrificing in connection with those matters than the Chairman of the Company, Mr. Arthur Lucas. Whether the means at the command of the Directors, the means adopted, and the time and place of commencing to encounter their difficulties have all been well and wisely chosen are matters upon which we do not care to remark. "It is easy to be wise after the event," certain critics of these observations may say; to which the reply may be given that the event frequently discloses what has previously been hidden from public scrutiny.

The final paragraph of the joint communication from the Solicitors is one to which we wish to direct the special attention of both the shareholders in this Company and other Companies with which the Directors of the Continental Union Company are associated, and that larger number of readers identified with the gas industry in many directions who for various reasons have been so remarkably interested in the late trial. "Both sides," write the Solicitors in their letter, "would feel much regret if it were supposed that any "imputation had been made on the personal honour or "integrity of Mr. Arthur Lucas, the Chairman of the defen-"dant Company, as such was not the case." It would also be much to our sorrow if in the hearing of the case any such reflection had been made, or if in our editorial comments on the case and its result anything has appeared that could be so construed. In these matters, management and policy we hold absolutely distinct from personal honour and integrity; and matters of company management and policy involve and concern the whole of any directorate, and not specially any individual member. It so happens that Mr. Arthur Lucas is the Chairman of the Continental Union Company; and therefore, for no other reason, Mr. Lucas has been drawn into somewhat unenviable prominence in this Milan case. But it would be malignant indeed for anyone because of that to attempt to degrade in any way his rectitude. By those who know him best, by those who have been brought into association with him in any way in business life, Mr. Lucas is to them one and all a gentleman whose conduct is directed solely by the purest conscientious regard for duty. There are other men, too, upon the Board whom it has been a pleasure to know in the position of administrators of gas company affairs for a great number of years; and it would be our first duty to resent any imputation upon their personal honour. Mistakes may (we among many others are quite at liberty to think and believe) have been made by the Board; and for them the Board must be judged collectively—not individually. But in judging them collectively, the constitution of the London Board (the members of which preponderate in the direction of the affairs of L'Union des Gaz) must be taken into account. We have a strong belief in composite Boards for the administration of great industrial concerns; and we do believe that, in regard to gas undertakings, one of the requisite elements in the compound of ability found on a Board is a knowledge (obtained from training and experience), on the part of at least one of the members, regarding the details of gas engineering structure, methods, and qualification. To this deficiency may probably be traced many a mistake. We know well all the old arguments as to Directors having paid qualified officials. There are answers to all those arguments. Enough has been said; but circumstances may require more.

There is to be a meeting of the shareholders of the Continental Union Gas Company on the 6th of June to consider a resolution affecting the regulations of the Company; and, if a statement is then made on the questions involved in the recent action, we sincerely hope that there will not be any shareholder who will commit the error of confusing the personal honour of the members of the Board with matters of management and policy.

Peaceful Picketing.

WHATEVER doubt there may have been in the minds of some as to what the Trade Unions mean by "peaceful" picketing, must be set at rest by the proceedings in the Trades Unions and Trade Disputes Bill in the Grand Committee on Law, to which it was referred after it had passed through the House of Commons by a majority of 122. So large a majority may, it is true, be held to indicate the desirability of some alteration of the law as it now stands; but as to the extent of the alteration desired by the Trade Unions, there is no longer room for any doubt whatever. It will be recollected that the Bill as originally drafted provided for the legalization of peaceful picketing, without any qualification other than may be conveyed by the term "peacefully." That is to say, it was to be made lawful for any person or persons, acting either on their own behalf or on behalf of a Trade Union or other association of individuals, to attend at or near a house or place where a person resides or works, or carries on his business or happens to be, either for the purpose of peacefully obtaining or communicating information, or of peacefully persuading any person to work or abstain from working. Much, it will be seen, depends upon the interpretation of the word "peace-"fully;" though not everything, since a "peaceful" crowd might have a very intimidating effect.

Efforts were made in the Grand Committee to obtain some more or less satisfactory definition of the term "peaceful picketing," in pursuance of promises made to this effect, during the debate on the second reading; but without avail. A final amendment, however, in the form of an addition to the clause, providing "that no person shall, "after being requested by any person annoyed by his con-"duct, or by any constable instructed by such person, to "move away, so act as wilfully to obstruct, insult, or annoy "such person," was carried by a small majority. Thereupon at the next meeting of the Grand Committee, the promoters declared that they regarded the carrying of this amendment as fatal to the Bill; and they moved that it be not further proceeded with. During the discussion on this motion, the Solicitor-General pointed out that objection to the amendment seemed to make it clear that, in being asked to allow peaceful picketing, they were really asked to allow persons to obstruct, insult, and annoy. Such is evidently the construction the promoters and the Labour members invite to be put upon their action; and it will be desirable to bear this in mind in any future discussion on the subject.

On the rejection of the motion, the promoters withdrew from any further consideration of the Bill. Clause 2, which proposed to amend the law of conspiracy in favour of Trade Unions, was then struck out; and clause 3, which exempts any Trade Union from liability for damage sustained by reason of the action of a member or members of such Trade Union, was amended by adding the words "unless "the member doing the acts complained of can lawfully be "held to be an agent of the Trade Union, or unless such "acts have been adopted or ratified by such Union." This practically leaves the law as it stands; but a further amendment was agreed to for the protection of the benefit funds of Trade Unions, which is certain to meet with general approval. It appears, however, from what was said by the Solicitor-General in the course of the discussion, that there is not the slightest chance of the Bill passing into law this year. That being so, a further opportunity is afforded the promoters and Labour members of considering their position with regard to its original proposals. In the next Parliament, which, according to all present appearances, is likely to be a Democratic one, they may have a better chance of enforcing their views. But we venture to think it will be a bad day for this country if class legislation such as that which they have promoted in two successive sessions of Parliament should ever be permitted.

Records at Birmingham.

With regard to their annual accounts which are noticed in another column to-day, the Birmingham Corporation Gas Department have made more than one record. In the first place, there is the sale of gas, which during the past twelve months evinced its usual tendency to get ahead of previous years, and was successful in doing so. The increase is not a large one, it is true—in fact, it is a smaller one than the Committee are accustomed to, being only 0·65 per cent.—but considering all things,

it cannot be looked upon as unsatisfactory. Dealing with the matter of consumption, it is to be remarked that a feature of the accounts is the growing popularity of the prepayment meter; the total number fixed having increased during the year from 30,000 odd to 36,000 odd; while an even larger addition was made to the cooking-stoves supplied to prepayment consumers. The second direction in which the Committee have beaten their previous best is in the amount of profits contributed in aid of the improvement rate of a single year. In addition to certain allowances in the way of public lighting, &c. (amounting to practically £20,000), there is on the present accounts available for the relief of the rates a sum of over £50,000. On more than one previous occasion the net profit has been larger, but then the sum available was divided so as to benefit more than one year's rates. The amount contributed now is a very satisfactory one from the ratepayers' point of view; while, so far as the consumers are concerned, it has to be borne in mind that this result has been achieved by the aid of very moderate charges for gas. Alderman Sir Hallewell Rogers stated in the City Council that it was the hope of the Committee to be able regularly to hand over £50,000 in aid of the rates; but that when they had done this, their attention would be turned to lowering the price of gas still further. If the principle of taking profits from municipal undertakings for the benefit of the ratepayers generally is acquiesced in, there is something to be said in favour of a fixed annual sum like this. The consumers, under these circumstances, at any rate know how much has to be contributed before they can hope for any further relief in the shape of lower charges.

Disposal of the Profits.

The question of what to do with the profits is always more or less to the fore when the accounts of municipal gas undertakings are being considered; and this year proves no exception to the rule. This is a problem that has not as yet presented itself to the Committees of some corporation trading departments, but so far as gas-works are concerned its satisfactory solution appears often to be almost as difficult as the making of the profits themselves. On the whole, however, there is evidence now of a more widely spread feeling than formerly existed that the consumer is entitled to first (if not to sole) consideration, though there is still, of course, in some quarters strong disposition to improve the financial aspect of municipal government by charging consumers an unnecessarily high price for their gas, or taking money that is required for the purposes of the undertaking. At Coventry, for instance, the proposal of the Gas Committee to hand £2000 of the profits over to aid the rates failed to satisfy one member, who thought 2d. in the pound was not much to be contributed by an undertaking to which they had looked for assistance in this way for fifteen or twenty years. He ended his pathetic appeal for a larger contribution with the remark that "the gas-works are the goose that lays the golden eggs; but they have laid very few lately." They would possibly lay still fewer in the future if he had his way. The Committee are at present removing their works; and this will mean the sacrifice of buildings, &c., valued at £50,000. They are, therefore, endeavouring to gradually provide for this loss out of the profits—a good use to which to put the surplus, for it will improve the financial position of the undertaking. Yet it was this particular "egg" which the member in question was desirous of securing for immediate consumption by the general body of ratepayers. At Newbury an attempt was likewise made to get the Council to increase the amount which the Gas Committee proposed to give to the rates; but with no better result—from the promoters' point of view. In fact, owing to the storm of opposition it aroused, the amendment was withdrawn. The consumers of Coventry and Newbury are to be congratulated on the non-success of these efforts to force the hands of their respective Gas Committees.

The Gas "Deal" in Philadelphia.

The story told in another column, of the recent proceedings of the Municipal Councils of Philadelphia in connection with the proposed extension of the lease of the gas-works to the United Gas Improvement Company, reveals the extent to which public feeling can be aroused when an attempt is made by the representatives of the people to carry through a transaction which it is believed will be detrimental to the general interests. As the result of extravagant management, Philadelphia found herself not long ago within $15,000,000 of her legal limit of indebtedness, while at the same time great improvements were in contemplation. How were the necessary funds to be raised? It was felt that an issue of bonds could only be made on disadvantageous terms; and so the brilliant idea occurred to the Chairman of the Sub-Committee on Finance of the Select Council that an arrangement might be come to with the Company whereby the future payments into the municipal exchequer under their lease could be capitalized for a lump sum. The Company agreed to this; and, as the result of conferences, it was decided that they should pay the City $25,000,000 down, and in return have their lease extended from 1927 till 1980, on the understanding that the price of gas should not be reduced, as provided by the existing lease, till the first-named year, and that afterwards it should be 90c. per 1000 cubic feet. When the terms of the arrangement became known, public indignation was aroused; and it was determined that the "deal" should not be carried out. Under the provisions of the lease, the City can take back the gas-works at the end of the first period of ten years (Dec. 31, 1907), on repaying to the Company the amount expended by them thereon, estimated at $15,600,000. In view of the feeling of the public, and as the result of a communication from the Mayor (Mr. John Weaver), it was subsequently decided to throw the thing open to competition. We are not aware how many tenders were received, or what terms were offered. It seems, however, that a section of the municipal representatives strongly support the agreement with the Gas Company. But it has a formidable opponent in the Mayor—an Englishman by birth—who refuses to sanction what in American language is called the proposed "grab." His determined attitude on this question has brought him into trouble, as he has now to defend an action brought against him in the Courts. He has retained Mr. Elihu Root, the former Secretary for War, for the purpose; and a sensational trial was expected to commence last Friday. This gas business has stirred Philadelphia to its very depths. Members of the Town Council have been personally attacked and forced to promise to support the Mayor on pain of being lynched or having their houses set on fire! Such a condition of things might have been expected in Chicago or in San Francisco; but it would hardly be looked for in the City of Brotherly Love! It is enough to make William Penn and its other Quaker founders turn in their graves.

"Agency Terms" or "Commission."

The sensational revelations made in connection with the defalcations of the Holborn Town Clerk have been productive of much pressure from Mr. Benn in the House of Commons, to incite the Government to move in the matter of putting an end to the payment of commissions or "agency" to the servants of public authorities. The expression "commission" has an ugly sound and associations; and "agency terms" seems to be one that is more to the liking of those concerned. In this case the Parliamentary Agents, it appears, had no direct business relations with the Holborn Borough Council, but all the work and correspondence was carried on directly with Jones who was a Solicitor, on, as they say, "agency terms," which is a term well-understood as between solicitor and solicitor. We do not in any way question the veracity of the Parliamentary Agents involved in this matter; but what we cannot understand is, why they "paid to" Jones certain sums for "agency," instead of Jones himself deducting the money when paying the Agents—seeing that the Agents had no communication with the Council direct. Is the Holborn method the one on which work on "agency terms" is usually conducted with officials of public bodies? Whether an official is a solicitor or not, so long as he is the paid servant of a public body, there ought not to be behind the backs of that body, for their particular work, any such arrangement even as "agency terms." Mr. A. J. Balfour, Mr. Gerald Balfour, and the Attorney-General have all had a turn at Mr. Benn over his several questions on the subject as to whether the attention of the Government has been called to these matters, and whether they propose to do anything to put a stop to such things. With one accord, the Premier, the President of the Local Government Board, and the Attorney-General distinguish the money paid to Jones as "agency terms." A suggestion has been advanced that the provisions of the Public

Bodies Corrupt Practices Act should be extended to cover payments of this kind; and nasty things have been said about the insufficiency of the audit of the accounts of local authorities. Seeing, however, that the question of commissions is at present engaging the attention of the Lord Chancellor, the Lord Chairman of Committees, and the Incorporated Law Society, the Government do not propose to make any further move in the matter at present; and therefore Mr. Benn and others who would purify the transactions of public officials who like Mr. Jones abuse their trust must have patience. Meanwhile, Mr. Benn seems to have overlooked the Horton Lunatic Asylum frauds which took certain officials to the Guildford Summer Assizes last year. Mr. Benn was Chairman of the London County Council at the time; and it was declared at the Assizes that not only were the indicted persons guilty, but the Council were also guilty of considerable laxity.

Miners and the Compensation Act.

The miners' organizations of Great Britain have held a two-days' conference for the special purpose of considering the Bill which is now in Parliament to amend the Workmen's Compensation Acts of 1897 and 1900. The clauses were taken seriatim; and it was decided to oppose many of them, and to support others. Disagreement was expressed with the proposal that notice of an accident should be lodged in writing within six days of its occurrence; preference being given to the existing provision that such notice should be handed in as soon as practicable. The same decision was arrived at with reference to the substitution of three months in place of the existing six months as the period during which action must be taken to enforce a claim. The clause for limiting by agreement between employer and employed the compensation payable in case of accident to workmen over sixty years of age, or those who are physically or mentally infirm, and so specially liable to accident, also meets with their disapproval, as does the provision for estimating the compensation payable to men not exclusively in one employment for four weeks immediately preceding an accident. The special grounds of their objection to the clause relating to the aged and infirm are that the adoption of such a provision would be a serious menace to the safety of the other workmen employed in a mine. On the other hand, it was decided to support the section referring to the weekly payments during incapacity to workmen under twenty-one years of age. Objection was taken to the continuation of the clause disallowing compensation in cases of "serious and wilful misconduct" of the workmen injured; it being contended that the interpretation put by the Courts upon the words quoted is such as to deprive workmen of compensation for the most trivial breaches of rules. Among the other provisions, both in the existing Acts and the amending Bill, with which the conference found fault was the one that renders employers not liable for injuries which disable men for a less period than two weeks from earning full wages at the work at which they were previously employed; their idea being that compensation should accrue from the date of the accident. They also contend that, with the law as at present framed, there is a temptation to men to stay away from work longer than the two weeks, when it is not really necessary, so as to obtain compensation.

Northern District of Ireland Gas Managers' Association.—We learn from Mr. J. Brodie, of Omagh, the Secretary and Treasurer of the above-named Association, that the next meeting will be held at Newtownards on the 7th prox. The members will meet in the Council-Room at the gas-works shortly after noon, when several matters will be brought forward for discussion by the President (Mr. W. H. Roberts), the Gas Engineer and Manager to the Urban District Council. After luncheon, the members and friends will proceed by rail to Donaghadee, and thence drive along the coast to Bangor, where tea will be served.

A Water-Tank Gauge of novel construction, which will be useful in a good many stations where the engineer is required to keep an elevated tank full, is described by Mr. John D. Adams in the "American Electrician." A float with an attached cord running down to a scale in some place visible from the engine-room will answer for a low tower; but it is impracticable with a high one. As a substitute, Mr. Adams has run a ¼-inch pipe from the tank into a mercury gauge in the engine-room. This gauge is merely a large U-tube with the water column acting on one leg balanced by the mercury in the other. At the top of the mercury is a gauge-glass indicating the height of the water in the tank.

THE MILAN INCLINED RETORT CASE.

A Joint Communication from the Solicitors.

It is with gratification that we have received the following letters relative to the recent case of *Graham, Morton, and Co. v. L'Union des Gaz.* The subject-matter of the letter signed jointly by Messrs. Spyer and Sons and Messrs. Waterhouse and Co., the Solicitors to the plaintiffs and defendants, is referred to in our editorial columns.

1, *New Court, Carey Street,*
Lincoln's Inn, W.C., 27th May, 1905.

Graham, Morton, and Co. v. Compagnie L'Union des Gaz.

Sir,—On behalf of Messrs. Spyer and Sons, the Solicitors in the above case for the plaintiffs, and on our own behalf as acting for the defendants, we ask you to be good enough to insert in your next issue the enclosed joint letter.

We are, Sir, Yours Obediently,
(Signed) Waterhouse and Co.

[Enclosure.]

London, 27th May, 1905.

Graham, Morton, and Co., Ltd., v. L'Union des Gaz.

Dear Sir,—Our attention has been called to the leading articles in your issues of the 16th and 23rd of May.

In view of the public interest this litigation has aroused, we desire, as Solicitors for the plaintiffs and defendants, to make a joint statement as to what the issues raised in the action were.

There was a conflict of fact as to whether the plaintiffs' work was well or ill done—*i.e.*, whether they had fulfilled their contract, and whether their design was good or the reverse; and these were the issues in the case.

These questions have been decided in Messrs. Graham, Morton, and Co.'s favour; and that decision is now unreservedly accepted. That being so, both sides would feel much regret if it were supposed that any imputation had been made on the personal honour or integrity of Mr. Arthur Lucas, the Chairman of the defendant Company, as such was not the case.

Yours faithfully,
Spyer and Sons,
Solicitors for Graham, Morton, and Co., Ltd.
Waterhouse and Co.,
Solicitors for the Compagnie L'Union des Gaz.

NOTES FROM WESTMINSTER.

The past week has yielded, as will be seen by our "Electric Lighting Memoranda," some decisions in connection with electricity supply and municipal trading in fittings, &c., which will appeal, as being most satisfactory, to ratepayers and more especially to those who are also gas purveyors or consumers. Municipal trading is slowly being tied down to the application of business principles to the transaction of business. The Hitchin Gas Company's Bill has gone forward; but, we regret to say, accompanied by a purchase clause. This is a non-statutory Company; and Lord Newton's Committee prefer a continuation of the custom of years, though there is no justification for its perpetuation. This matter is referred to in our editorial columns; and therefore may be dismissed here without further comment. The Rhymney and Aber Valleys Gas and Water Company have succeeded, as they did in the Lords, in persuading the Standing Orders Committee of the House of Commons to dispense with Standing Orders so that their hurriedly deposited Bill may proceed, and afford them relief from the pressure of want of capital, under the circumstances related last week. Water measures have been a prominent line again this week. A gratifying piece of news for the water consumers of Stockport is that Lord Newton has retired from opposition to the Corporation Bill in respect of certain easements and pipe-lines across his lands; and it is now unopposed. The Southport, Birkdale, &c., Water Board Bill has been for some days before Lord Barnard's Committee; and they resume the hearing to-day. The water clauses of the Llandrindod Water Bill have been rejected. These latter Water Bills we will deal with further in an early issue.

The Inland Revenue and Conveyance Duty.—With reference to the remarks on this subject which appeared in the last number of the "Journal," as well as in the issue for the 2nd inst., we learn that the Gas Companies' Protection Association are taking the opinion of Mr. Danckwerts, K.C., thereon.

THE INSTITUTION OF GAS ENGINEERS.

ANNUAL MEETING, MAY 30, 31, and JUNE 1, 1905.

INAUGURAL ADDRESS OF THE PRESIDENT,

Mr. DANIEL IRVING, M.Inst.C.E., of Bristol.

Gentlemen,—I desire to thank you all very sincerely for the great honour you conferred upon me by electing me to this Chair, which was the more gratifying as I knew that I had no special claims to the distinction. I also value it as a compliment to the important Provincial gas undertaking supplying the ancient city of Bristol, with which I am identified.

We meet in interesting times. The renown of gas has received a great impulse throughout the kingdom—it might be said throughout the whole world—by the success of the International Gas Exhibition at Earl's Court, promoted by this Institution, and rendered possible only by its co-operation. The various classes of manufacturers connected with our industry responded nobly to the invitation given in your name to assist in vindicating the claims of gas to meet the public demands for light, for heat, and for power. The visit and reception of the Continental, American, and Colonial gas engineers organized by your Council formed a memorable and gratifying incident of this enterprise. The thanks of the Institution are due to the Executive Committee and its officers for their devoted and admirably directed services in connection with the organization and conduct of the Exhibition.

It is my pleasing duty to congratulate you upon the completion of the affiliation with the Institution of the District Associations named in the report of your Council, and the great increase of membership which has resulted therefrom. I am not without hope of the completion at no distant date of this union for the profession of the whole of the United Kingdom of Great Britain and Ireland. The advantages of unity are so great that this consummation cannot be long delayed.

I should like to acknowledge, on behalf of the whole industry (which I am afraid sometimes forgets the fact), our indebtedness to the great Metropolitan Gas Companies for the boldness and the fortitude with which they fight the battles of the industry. Looking backwards, or looking round at the present time, it must be perceived that the Metropolitan Companies have ever been in the forefront of every aggressive movement that has brought the gas industry into conflict with the forces of reaction and municipal wrong-headedness. They bear the brunt of almost every onslaught, and pay the expenses; and we who are glad to profit by their example, and share the fruits of victory in the shape of amended Acts of Parliament, should not omit to praise those who form the fighting-line. In all probability we should be far more stagnant than we are but for these doughty champions, who, being placed at the very centre of things, feel every impulse of the common civilized life first, and whose stake in having all things right for the industry is so great that they can afford to oppose Parliament itself, in order to safeguard their proper interests, which are mostly our interests also. So it has come to pass that London practically stands for us "in the gate" against our enemies.

I could wish that this Institution were made more useful to the industry as a whole. I do not contemplate, it is hardly necessary to premise, any enlargement of the activity of our organization in the sense of making it a militant body, because it cannot have *locus standi* where the fortunes of undertakings may be put to the hazard of parliamentary conflict, or of litigation. But the events of the past year have strengthened the opinion that the basis of the Institution is not broad enough for the work which, whether coming from within or without, it might legitimately be expected to do, besides fulfilling the not unimportant purpose of holding yearly meetings. The moment such a call is made upon our organization, or whenever it is approached as representative of the gas industry of this country, its Executive for the time being find themselves hampered by a lack of funds altogether incompatible with the position they are supposed to occupy in relation to the industry, with its enormous capital of 120 millions.

There are pending at the present time a number of matters of vast importance to the industry which have been forced upon the attention of your Council, and are by their directions to be brought before you for consideration during this meeting. However worthy of treatment by this Institution you may deem these matters to be, it will be impossible to deal with them worthily, and with any hope of success, unless the administrators of the gas undertakings who will gather all the profit—if profit there be—come forward with the necessary funds. It cannot be reasonably expected that the members of this Institution should bear the costs of work of this kind. Therefore it is suggested that we issue an appeal for money to form an Investigation and Research Fund, which the Council are willing to take the responsibility of administering. But this movement, if successful, will undoubtedly sooner or later bring with it the natural demands for an extension of our franchise, which I for one would be prepared to favourably consider.

I should entirely fail in my duty to you if I abstained from mentioning the report of the Departmental Committee appointed by the Board of Trade to inquire into the question of gas testing in London. I feel at liberty to do this, however, because you have had the matter before you in the report of your Council. I have no wish to go over the ground again; but I desire to emphasize the view of the situation that it is of an extraordinary character. I, therefore, take this opportunity for placing upon record my personal judgment of the recommendation for the restoration of the 5 cubic feet rate of consumption of gas under test, as being unscientific and unjust to all gas under 16-candle power, and impracticable with gas of 17-candle power and over.

I trust that no apology is needed for offering a course of statistics as the solid dish in a Presidential Address, which must, in a general way, touch upon a number of transitory topics, such as are forced by the necessities of the position upon the occupant of this Chair. At any rate, I have no intention to apologize for submitting to this meeting a quantity of statistical matter relating to, and designed to elucidate, some of the more problematical economics of our industry, in the hope that, whether my own observations upon the data are deserving of attention or not, the facts themselves will, I trust, constitute a useful record of the state of things which the members of this Institution have been to a large extent instrumental in creating.

I should like to remark, by way of commending these tables to your attention—both now and when you will receive them in the "Transactions" of the Institution—that, in my judgment, the statistical method is the crown of an engineer's equipment for his professional work. It is only by the proper employment of this method of investigating the facts which it is our business to understand, that safe and trustworthy guidance can be secured. I say this with greater emphasis, because in scarcely any of the discussions on the education of engineers which have raged so furiously of late years, is practice in the art of preparing and applying statistics so much as mentioned as a necessary element in engineering culture. This may be, of course, because such practice is something that the student must accomplish for himself, of his own motion, and therefore belongs to the category of self-instruction. It is very true that every man who really knows anything is self-taught. I regard it as of vast importance that this particular form of educational exercise should be strongly urged upon all seekers after real knowledge and progress.

There is a familiar caution, not to be forgotten in connection with this subject, which asserts that nothing is more misleading than facts, except figures; also that figures can be made to prove anything. Our facts and figures, which are one and the same thing—for we are not discussing figures that are not facts—should be our servants, not our masters. There is a pedantry of statistics as of other

TABLE No. 1.—ANALYSIS OF THE BOARD OF TRADE RETURNS

GAS MADE AND SOLD FOR PUBLIC AND PRIVATE CONSUMPTION, NUMBER OF

	Year.	1 Number of Undertakings.	2 Coal Carbonized.	3 Gas Made.	4 Gas Made per Ton of Coal.	5 Gas Sold.	6 Gas Sold per Ton of Coal.	7 Length of Mains.	8 Total Gas Sold per Mile of Main.	9 Gas Sold to Private Consumers.	10 Gas Sold to Private Consumers Per Cent. of Make.	11 Gas Sold to Private Consumers per Mile of Main.	12 Gas Sold to Private Consumers per Consumer.	13 Number of Private Consumers	14 Number of Private Consumers per Mile of Main.	15 Gas Sold for Public Lamps.	
			Tons.	1000 C. Ft.	C. Ft.	1000 C. Ft.	C. Ft.	Miles.	1000 C.Ft.	1000 C. Ft.		1000 C.Ft.	C. Ft.			1000 C. Ft.	
Gas Companies.	1893	428	6,995,125	71,050,955	10,157	65,489,969	9362	14,345	4565	60,339,542	84·924	4206	49,247	1,225,253	85·40	5,150,427	1
	1894	428	7,128,126	72,610,842	10,186	66,977,907	9396	14,557	4601	61,831,274	85·154	4247	48,803	1,266,943	87·03	5,146,633	2
	1895	429	7,531,131	77,245,618	10,257	70,977,871	9425	14,824	4788	65,785,850	85·165	4438	49,104	1,339,712	90·37	5,192,021	3
	1896	433	7,681,770	80,015,323	10,416	73,750,534	9600	15,141	4871	68,442,834	85·537	4520	47,554	1,439,272	95·06	5,307,700	4
	1897	436	7,963,465	84,040,176	10,553	77,772,192	9766	15,509	5014	72,286,775	86·015	4661	46,648	1,549,627	99·92	5,485,417	5
	1898	439	7,958,669	86,705,723	10,250	80,077,717	9417	15,451	5182	74,609,634	86·049	4829	44,653	1,670,847	108·14	5,468,083	6
	1899	450	8,321,187	91,794,898	10,175	84,752,031	9329	16,416	5162	79,194,028	86·273	4824	43,570	1,817,649	110·72	5,558,003	7
	1900	453	8,426,853	94,869,749	10,197	87,687,174	9344	16,748	5235	82,277,977	86·727	4912	42,284	1,945,825	116·18	5,409,197	8
	1901	454	8,580,365	97,386,619	10,014	89,685,208	9122	17,032	5265	84,244,989	86·506	4946	41,128	2,048,359	120·26	5,440,219	9
	1902	454	8,520,004	99,676,048	10,244	91,956,324	9337	17,512	5251	86,577,950	86·860	4944	39,390	2,197,987	125·51	5,378,374	10
	1903	459	8,528,823	101,490,084	10,369	93,923,290	9481	18,074	5196	88,538,829	87·239	4898	37,117	2,385,348	131·97	5,384,461	11
	—	4435	80,640,393	885,835,080	10,264	817,560,248	9417	161,265	5070	763,790,140	86·223	4736	43,247	17,661,569	109·52	53,770,108	12
Local Authorities.	1893	192	4,025,167	39,730,832	9,870	36,396,400	9042	8,481	4291	33,306,954	83·831	3927	27,159	1,226,332	144·6c	3,089,446	13
	1894	199	4,191,175	41,684,838	9,945	38,183,083	9110	8,753	4362	34,948,082	83·839	3993	27,796	1,257,274	143·64	3,235,001	14
	1895	203	4,406,315	44,176,134	10,025	40,465,831	9183	9,033	4480	37,099,447	83·981	4107	28,104	1,320,059	146·13	3,366,384	15
	1896	208	4,614,969	47,026,280	10,190	43,132,780	9346	9,316	4630	39,657,596	84·331	4257	28,196	1,406,456	150·97	3,475,184	16
	1897	212	4,652,688	48,652,559	10,456	44,447,487	9553	9,648	4606	40,798,800	83·859	4228	27,646	1,475,749	152·96	3,648,687	17
	1898	222	4,883,148	51,441,272	10,068	47,287,360	9218	10,030	4714	43,479,104	84·522	4335	27,548	1,578,291	157·35	3,808,256	18
	1899	232	5,289,501	55,360,659	10,108	50,969,666	9078	10,391	4905	47,029,818	84·952	4526	28,197	1,667,908	160·51	3,939,848	19
	1900	240	5,479,435	57,138,062	9,850	52,731,280	9046	10,843	4863	48,671,734	85·182	4489	27,537	1,767,464	163·00	4,059,546	20
	1901	251	5,522,264	59,300,273	10,022	54,373,348	9132	11,253	4832	50,232,071	84·708	4464	26,824	1,872,633	166·41	4,141,277	21
	1902	256	5,589,215	60,902,739	10,098	55,776,260	9182	11,632	4795	51,474,814	84·520	4425	26,119	1,970,738	169·42	4,301,446	22
	1903	260	5,673,013	62,717,759	10,200	57,754,404	9325	11,952	4832	53,341,685	85·050	4463	27,414	1,945,777	162·80	4,412,719	23
	—	2283	50,301,723	528,400,575	10,073	485,121,499	9213	102,851	4717	446,733,151	84·544	4344	27,471	16,262,349	158·11	38,388,348	24

Companies	Increase Decrease	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	Increase	31	21·78 p.c.	42·84 p.c.	212 c.f.	43·41 p.c.	119 c.f.	3729 miles	631	46·73 p.c.	2·315	692	12,130	94·69 p.c.	46·57	1 2
Local Authorities	Decrease	No. 68	40·94 p.c.	57·86 p.c.	330 c.f.	58·68 p.c.	283 c.f.	3471 miles	541	60·15 p.c.	1·219	536	255	58·67 p.c.	18·20	3 4
Total of Companies and Local Authorities	1893	620	11,020,292	110,781,788	10,052	101,886,370	9244	22,826	4463	93,646,496	84·532	4102	38,198	2,451,585	107·00	5
	1903	719	14,201,836	164,207,843	10,301	151,677,694	9419	30,026	5051	141,880,514	86·403	4725	32,758	4,331,125	144·25	6
	Increase	99	28·88 p.c.	48·22 p.c.	249 c.f.	48·87 p.c.	175 c.f.	7200 miles	588	51·50 p.c.	1·871	623	5,440	76·63 p.c.	37·30	7 8
Comparison of Averages, Companies	Increase Decrease				91 c.f.		55 c.f.		785		1·327	785	3,402		24·78	9 10
Local Authorities	Increase Decrease				208 c.f.		146 c.f.		574		0·781	544	2,253		6·01	11 12

studies proper enough in their place; and it should be part of the training in the statistical method which I so heartily recommend, to figure only about what is worth the trouble, and always to retain the mastery of our statistics, so as to prevent them from landing us into ridiculous conclusions. Practical knowledge and sound judgment are indispensable.

In the preliminary chapter of "Sartor Resartus," the Sage eulogizes the then peaceful German who, from his scientific watch-tower, can "tell the universe, which so often forgets that fact, what o'clock it really is." It is the statistician who, from his dry rummaging and classification of figures, emerges with those declarations of the time of day by which the controllers of industrial and commercial undertakings "set their clocks." I have considered it part of my duty, as your President, to try my hand at a task of this nature; and out of a mass of statistics which have been some time in collating and arranging, to indicate where the gas industry of the United Kingdom really stands, and what are the actual tendencies of its contemporary developments. For this purpose, recourse has been had to the Board of Trade returns and "Field's Analyses," which have now been published for a sufficiently long period to supply the necessary data for the erection of comparative measurements at wide intervals of time. I hope to be able to show—without trespassing outrageously upon your patience—that these figures can still reveal to an inquiring eye fresh information which it is to our advantage to possess.

In the midst of all the developments of this prosperous and growing industry, we hear clamourings for cheaper gas; and in view of all that has been accomplished by way of economizing in the manufacture and utilization of gas itself, and in the finance of the industry, what are the broad tendencies of the industry as a whole, and in what way do they differ from the record of an earlier era?

I was attracted to this investigation by recollection of my previous work in the same field, when, in 1895, I brought the subject of "Unaccounted-For Gas" before the Gas Institute. The tables then prepared covered a period of eleven years, and are published in the 1895 "Transactions" of the Institute. It occurred to me that these tables might be extended and brought down to date; and the results are now before you.

Table No. 1 is an analysis of the Board of Trade returns from 1893 to 1903 inclusive. The returns relating to water gas, which now amounts to 10 per cent. of the gas

RELATING TO THE UNITED KINGDOM, 1893 TO 1903 INCLUSIVE.

CONSUMERS, AND PUBLIC LAMPS, MILES OF MAINS, AND GAS UNACCOUNTED FOR.

	16 Gas Sold for Public Lamps per Cent. of Make.	17 Gas Sold for Public Lamps per Mile of Main.	18 Gas Sold for Public Lamps per Lamp.	19 Number of Public Lamps.	20 Number of Public Lamps per Mile of Main.	21 Gas Used on Works, Estimated at 1 per Cent. of Make.	22 Gas Accounted for, per Cent. of Make.	23 Gas Unaccounted for.	24 Gas Unaccounted for, per Cent. of Make.	25 Gas Unaccounted for, per Ton of Coal.	26 Gas Unaccounted for, per Consumer and Public Lamp.	27 Gas Unaccounted for, per Mile of Main.	28 Water Gas Made and Sold.	29 Water Gas Made and Sold per Ton.	Number of Undertakings.	Year.	
		1000 C.Ft.	Cub. Ft.			1000 C. Ft.		1000 C. Ft.		Cub. Ft.	Cub. Ft.	1000 C.Ft.					
1	7·249	359	17,346	292,410	20·697	710,509	93·173	4,850,477	6·827	693	3186	338	..	..	428	1893	Gas Companies.
2	7·088	354	17,399	295,787	20·319	726,108	93·242	4,906,827	6·758	688	3139	337	..	..	428	1894	
3	6·721	350	17,191	302,015	20·373	772,456	92·886	5,495,291	7·114	729	3347	370	..	..	429	1895	
4	6 633	351	17,222	308,180	20·354	800,153	93·171	5,464,636	6·829	711	3126	361	..	..	433	1896	
5	6·527	353	17,454	314,451	20·275	840,401	93·542	5,427,583	6·458	681	2911	350	..	..	436	1897	
6	6·307	354	17,141	319,007	20·646	867,057	93·356	5,760,949	6·644	724	2895	372	5,125,804	644	439	1898	
7	6·055	338	17,145	324,166	19·747	917,948	93·328	6,124,919	6·672	736	2859	373	7,121,198	856	450	1899	
8	5·702	323	16,551	326,813	19·513	948,697	93·429	6,233,878	6·571	739	2743	372	8,945,670	1061	453	1900	
9	5·586	319	16,677	326,209	19·153	973,866	93·092	6,727,545	6·908	784	2833	395	11,410,279	1330	454	1901	
10	5·396	307	16,137	333,303	19·033	996,760	93·255	6,722,964	6·745	789	2656	384	12,407,734	1456	454	1902	
11	5·305	298	16,055	335,363	18·555	1,014,900	93·544	6,551,894	6·456	769	2408	362	13,056,741	1531	459	1903	
12	6·070	334	16,880	3,185,294	19·753	8,858,346	93·293	59,415,486	6·707	737	2857	368	58,067,426	721	4435	—	
13	7·776	364	14,689	210,316	24·798	397,308	92·607	2,937,124	7·393	729	2044	346	..	..	192	1893	Local Authorities.
14	7·761	369	14,903	217,069	24·799	416,848	92·600	3,084,907	7·400	736	2092	352	..	..	199	1894	
15	7·620	373	14,970	224,873	24·895	441,761	92·601	3,268,542	7·399	741	2115	362	..	..	203	1895	
16	7·390	373	14,949	232,464	24·953	470,262	92·721	3,423,238	7·279	742	2088	367	..	..	208	1896	
17	7·499	378	15,244	239,352	24·808	486,525	92·357	3,718,547	7·643	799	2168	385	..	..	212	1897	
18	7·403	379	15,364	247,857	24·711	514,412	92·925	3,639,500	7·075	745	1992	363	2,278,390	466	222	1898	
19	7·117	379	15,328	257,040	24·736	553,606	93·069	3,837,387	6·931	725	1993	369	2,955,828	558	232	1899	
20	7·105	374	14,585	278,343	25·670	571,380	93·287	3,835,402	6·713	700	1874	353	3,162,782	577	240	1900	
21	6·984	368	14,385	287,887	25·583	593,002	92·692	4,333,923	7·308	785	2006	385	3,955,621	716	251	1901	
22	7 063	370	14,590	294,828	25·346	609,027	92·583	4,517,452	7·417	809	1994	388	4,459,916	798	256	1902	
23	7·036	369	14,645	301,308	25·209	627,177	93·086	4,336,178	6·914	764	1929	362	4,850,007	855	260	1903	
24	7·265	373	14,873	2,581,021	25·095	5,284,000	92·809	37,995,076	7·191	755	2016	369	21,662,544	431	2283	—	

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
1	4·54 p.c.				14·69 p.c.		30·00 p.c.		35·08 p.c.		76		24			Increase	Companies
2		1·944	61	1,291		2·15		0·371		0·371		778				Decrease	
3	42·83 p.c.		5		43·26 p.c.	0·41	57·86 p.c.	0·479	47·63 p.c.		35		16			Increase	Local Authorities
4		0·740		44						0.479		115				Decrease	
5	8,239,873	7·438	361	16,245	507,226	22·220	1,107,817	92·980	7,787,601	7·020	706	2632	341			1893	Total of Companies and Local Authorities
6	9,797,180	5·966	326	15,388	636,671	21·204	1,642,077	93·369	10,888,072	6·631	767	2192	363	17,906,748	1261	1903	
7	18·90 p.c.				25·53 p.c.		48·22 p.c.	0·389	39·81 p.c.		61		22			Increase	
8		1·472	35	857		1·01				0·389		440				Decrease	
9			3	58		0·10		0·278			26		43			Increase	Comparison of Averages, Companies
10		1·049								0·278		258				Decrease	
11			30	726		0·91		0·449			2	33	22			Increase	Local Authorities
12		0·237								0·449						Decrease	

made, are tabulated and kept distinct, so as not to confuse the analysis relating to gas made and sold per ton of coals. The comparative analyses throughout are based on the thousand cubic feet of gas sold; the old factor of per "ton of coal" being no longer of any value. The returns include 719 distinct gas undertakings. The figures, which are really the working returns, relating to 459 companies and 260 local authorities, are given separate in each case, and the average is stated separately for each decade. This covers the considerable period from 1883 to 1903, or twenty years of the most changeful and strenuous epoch known to the industry. Consider what is covered in that time, relating to the industry, but mostly not of it. There are: (*a*) The application to companies of the sliding-scale and auction clauses, whereby the average cost of capital has been greatly reduced. (*b*) The extension of the transference of gas undertakings from companies to local authorities, and the settling of the latter into the enterprise of gas supply. (*c*) The introduction of commercial electric lighting, with incitement to local authorities to take it. (*d*) The popularization of gas cooking-stoves and fires. (*e*) The introduction of the gas-engine. (*f*) The invention and perfection of the incandescent gas-light. (*g*) The new labour movement, the introduction of mechanical power for gas making, and workmen's compensation and superannuation. (*h*) The importation of carburetted water-gas plants. (*i*) Prepayment meters and the assisted fitting-up of small houses. (*j*) The great development of the fine chemical industry using gas residuals as raw material. The list is a formidable one, furnishing ten good reasons for looking out for an appreciable modification of the fundamentals of the gas industry.

Table No. 2 shows the receipts and expenditure and gross profits, together with the capital expenditure, for each class of undertaking from 1887 (the first year any data respecting capital were furnished) down to and including 1903. The average of the first and last seven years of this period is given for the purpose of comparison.

What do we discern from all the tables and the diagrams which show their truths in graphic form? The net result of all these influences has simply been to leave the fundamental factors unchanged, in bearing and relative values. Gas is no cheaper to make now than it was twenty years ago. In Table No. 2, it is shown that, whereas the expenditure by the companies on revenue account, for making 1000 cubic feet of gas, averaged 2s. 8¾d. for the seven years up to and including 1893, the corresponding expenditure for the

TABLE No. 2.—ANALYSIS OF BOARD OF TRADE RETURNS RELATING TO THE UNITED KINGDOM, FROM 1887 TO 1903 INCLUSIVE.

CAPITAL, RECEIPTS, EXPENDITURE.

COMPANIES.

	Year.	Number of Undertakings.	Gas Sold.	Total Capital Issued.	Capital Issued per 1000 C. Ft. Sold.	Receipts.	Receipts per 1000 C. Ft. Sold.	Expenditure.	Expenditure per 1000 C. Ft. Sold.	Balance or Gross Profit.	Balance per Cent. on Capital.
			1000 C. Ft.	£	s. d.	£	s. d.	£	s. d.	s. d.	
Period of 7 years.	1887	384	56,240,641	37,396,580	13 3½	10,433,523	3 8½	7,143,083	2 6½	1 2	8·79
	1888	395	57,475,515	37,738,534	13 1½	10,534,721	3 7¾	7,101,974	2 5½	1 2¼	9·09
	1889	405	59,600,303	38,207,748	12 9¾	10,778,246	3 7½	7,634,605	2 6¾	1 0¾	8·22
	1890	416	61,953,759	39,452,702	12 8¾	11,671,916	3 9¼	8,917,443	2 10½	0 10¾	6·98
	1891	422	65,338,278	41,144,281	12 7	12,489,368	3 9¾	9,718,342	2 11½	0 10½	6·73
	1892	429	66,766,588	42,416,265	12 8½	12,692,974	3 9½	9,546,512	2 10¼	0 11¼	7·41
	1893	428	65,489,970	44,036,125	13 5¼	12,609,845	3 10¼	9,228,732	2 9¾	1 0½	7·68
Totals and averages		2879	432,865,054	280,392,235	12 11½	81,210,593	3 9	59,290,691	2 8¾	1 0¼	7·81
During period— Increase . . . Decrease . . .		44	16·45 p.c.	17·75 p.c.	0 2	20·86	0 1¾	29·20 p. c.	0 3¼	0 1½	1·11 p.c.
	1894	428	66,977,907	44,798,877	13 4½	13,006,219	3 10½	9,110,485	2 8½	1 2	8·70
	1895	429	70,977,871	45,195,416	12 8¾	12,982,956	3 8	9,491,344	2 8	1 0	7·73
	1896	433	73,750,534	49,619,035	13 5¾	13,020,229	3 6¼	9,539,195	2 7	0 11¼	7·01
Period of 7 years.	1897	436	77,772,192	51,260,194	13 2	13,447,570	3 5¼	9,922,822	2 6½	0 11	6·88
	1898	439	80,077,717	53,494,781	*13 4¼	14,092,125	3 6¼	10,309,948	2 6¾	0 11½	7·03
	1899	450	84,752,031	69,388,150	*16 4½	15,514,700	3 8	11,478,442	2 8½	0 11½	5·82
	1900	453	87,587,174	71,414,519	16 3½	17,638,963	4 0¼	13,864,808	3 2	0 10¼	5·28
	1901	454	89,685,208	73,977,378	16 6	17,955,187	4 0	14,537,797	3 2¾	0 9¼	4·62
	1902	454	91,956,324	77,129,037	16 9¼	17,205,092	3 8¾	13,167,186	2 10¼	0 10½	5·23
	1903	459	93,923,290	80,869,179	17 2½	17,756,626	3 9¼	13,214,322	2 9¾	0 11½	5·61
Totals and averages		3145	605,853,936	477,533,238	15 9¼	113,610,263	3 9	86,495,325	2 10¼	0 10¾	5·68
During period— Increase . . . Decrease . . .		23	18·19	57·76 p.c.	4 0½	32·04 p.c.	0 3¾	33·17 p.c.	0 3¼	0 0½	1·27
Averages— Increase . . . Decrease . . .					2 9¾		Nil. ,,		0 1½	0 1½	2·13

* The conversion of the Gaslight and Coke Company's Stock accounts for more than this increase (3s. 3¾d.).

LOCAL AUTHORITIES.

	Year.	Number of Undertakings.	Gas Sold.	Total Amount Borrowed.	Amount Borrowed per 1000 C.F. Sold.	Receipts.	Receipts per 1000 C. F. Sold.	Expenditure.	Expenditure per 1000 C. F. Sold.	Balance or Gross Profit.	Balance per Cent. on Loan.
			1000 C. Ft.	£	s. d.	£	s. d.	£	s. d.	s. d.	
Period of 7 years.	1887	168	27,418,050	20,081,435	14 7¾	4,495,093	3 3¼	3,161,604	2 3½	0 11¾	6·63
	1888	173	29,547,773	21,333,833	14 5¼	4,817,269	3 3¾	3,375,197	2 3¼	1 0	6·76
	1889	173	30,652,292	21,669,789	14 1½	5,067,843	3 3¾	3,627,578	2 4¼	0 11¼	6·64
	1890	178	32,691,854	21,891,655	13 4½	5,628,212	3 5¼	4,231,643	2 7	0 10¼	6·37
	1891	182	34,531,527	22,476,180	13 0¼	5,906,319	3 5	4,589,109	2 8	0 9	5·85
	1892	185	36,067,964	22,734,556	12 7¼	5,983,359	3 3¾	4,702,179	2 7¼	0 8½	5·63
	1893	192	36,396,401	23,619,082	12 11¾	6,219,460	3 5	4,866,486	2 8	0 9	5·73
Totals and averages		1251	227,305,861	153,806,530	13 6½	38,117,555	3 4¼	28,553,796	2 6¼	0 10	6·21
During period— Increase . . . Decrease . . .		24	32·75 p.c.	17·61 p.c.	1 8	38·36 p.c.	0 1¾	53·92 p.c.	0 4½	0 2¾	0·90 p.c.
	1894	199	38,183,083	24,624,554	12 10¾	6,402,046	3 4¼	4,681,035	2 5½	0 10¾	6·98
	1895	203	40,465,831	25,624,326	12 8	6,478,191	3 2½	4,881,944	2 5	0 9½	6·23
	1896	208	43,132,780	26,561,689	12 3¾	6,639,342	3 1	4,989,283	2 3¾	0 9¼	6·21
Period of 7 years.	1897	212	44,447,487	27,376,324	12 3¾	6,759,883	3 0½	5,058,705	2 3¼	0 9¼	6·21
	1898	222	47,287,360	28,614,971	12 1¼	7,177,670	3 0½	5,365,995	2 3¼	0 9¼	6·33
	1899	232	50,969,666	29,658,730	11 7½	8,048,089	3 1¾	6,155,725	2 5	0 8¾	6·38
	1900	240	52,731,280	31,509,701	11 11½	9,121,418	3 5¼	7,463,693	2 10	0 7½	5·26
	1901	251	54,373,348	34,045,442	12 6¼	9,300,567	3 5	7,630,856	2 9¾	0 7¼	4·90
	1902	256	55,776,260	35,738,023	12 7¼	9,554,984	3 5	7,215,502	2 7	0 10	6·54
	1903	260	57,754,404	37,103,279	12 10½	9,819,685	3 4¾	7,182,008	2 5¾	0 11	7·11
Totals and averages		1673	363,339,805	224,046,470	12 4	59,782,296	3 3½	46,072,484	2 6½	0 9	6·12
During period— Increase . . . Decrease . . .		48	29·93	35·53 p.c.	0 6½	45·26 p.c.	0 4¼	41·97 p.c.	0 2½	0 1¾	0·90
Averages— Increase . . . Decrease . . .					1 2½		0 0¾		0 0¼	0 1	0·09

TOTAL OF COMPANIES AND LOCAL AUTHORITIES.

			£	s. d.	£	s. d.	£	s. d.	s. d.	
1887	552	83,658,691	57,478,015	13 8¾	14,928,616	3 6¾	10,304,687	2 5¼	1 1¼	8·04
1903	719	151,677,694	117,972,458	15 6¾	27,576,311	3 7½	20,396,330	2 8¼	0 11¼	6·08
Combined period— Increase . . . Decrease . . .	167	81·30 p.c.	105·24 p.c.	1 9¾	84·71 p.c.	0 0¾	97·93 p.c.	0 2¾	0 2	1·96

DIAGRAM No. 1.—PROGRESS OF THE GAS INDUSTRY FOR THE UNITED KINGDOM. COMPANIES AND LOCAL AUTHORITIES TOGETHER, FROM 1883 TO 1903. THE DIAGRAM SHOWS THE TOTAL GAS MADE, SOLD, Etc., PER ANNUM, AND COMPARED WITH THE TOTAL CAPITAL EMPLOYED, AS GIVEN BY THE BOARD OF TRADE RETURNS.

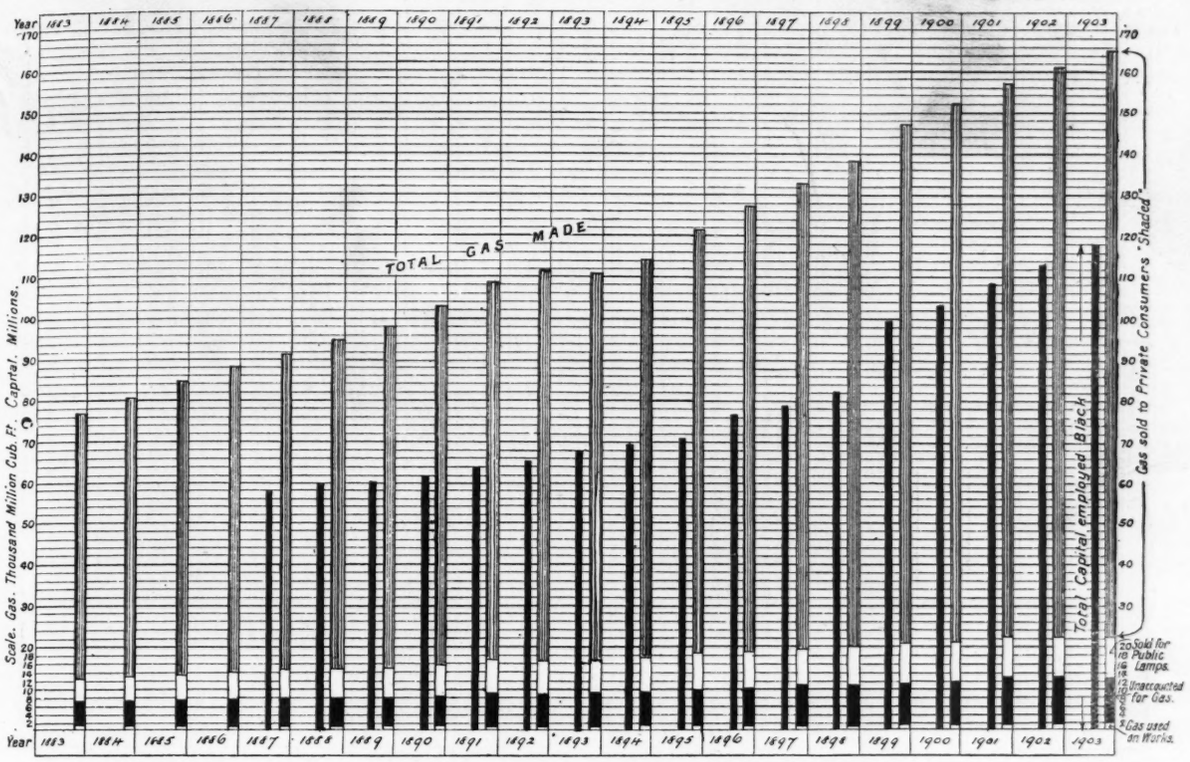
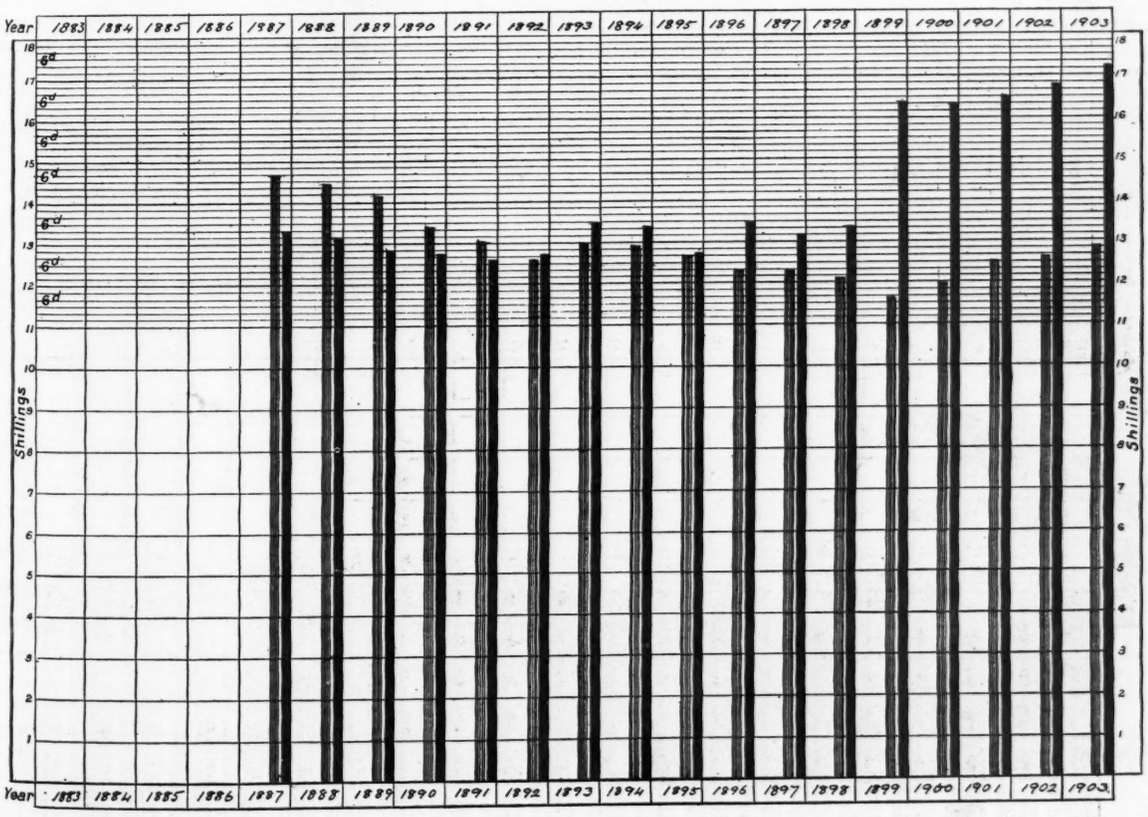

Year
1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903
TOTAL GAS MADE
Scale. Gas. Thousand Million Cub. Ft. Capital. Millions.
Total Capital employed Black
Gas sold to Private Consumers "Shaded"
20 Sold for 10 Public Lamps.
Unaccounted for Gas.
Gas used on Works.

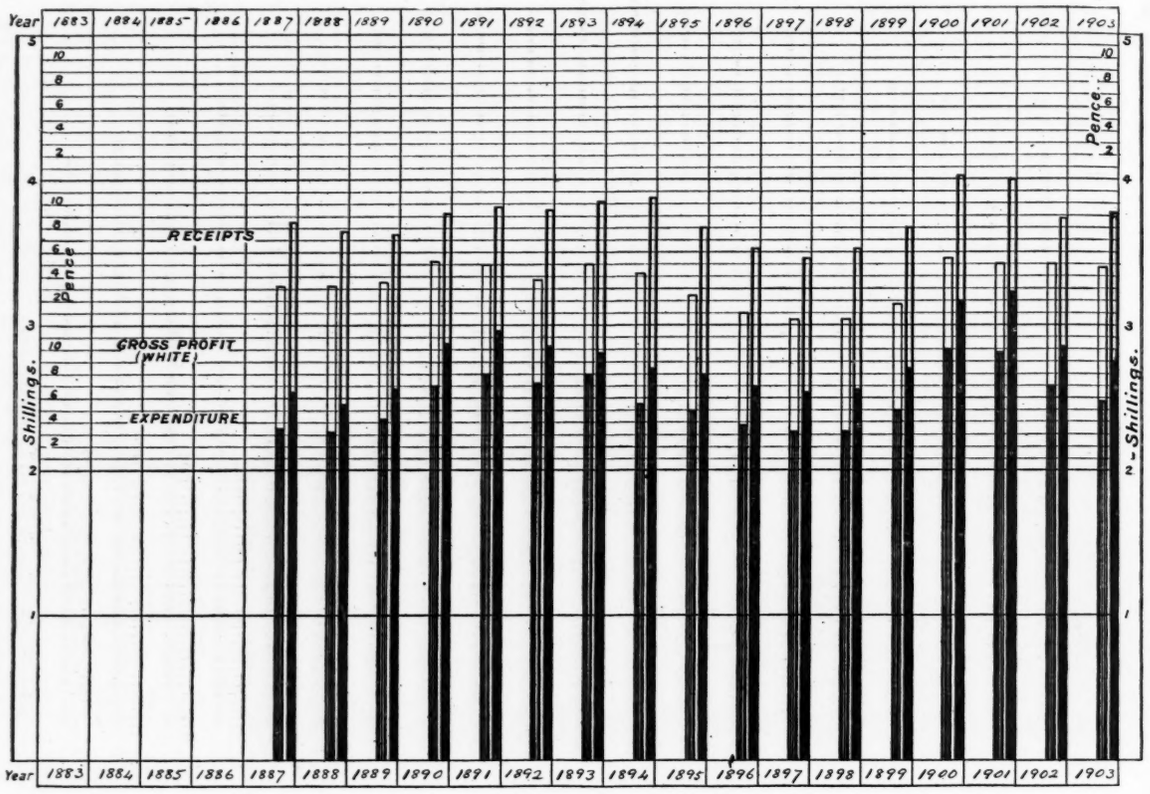
DIAGRAM No. 2.—CAPITAL EMPLOYED PER 1000 CUBIC FEET OF GAS SOLD, FROM 1887 TO 1903. BLACK COLUMNS ARE FOR COMPANIES, SHADED FOR LOCAL AUTHORITIES.



seven years ending 1903 averaged 2s. 10¼d. So that the sum and substance of manufacturers' "improvements" over these periods left the companies 1½d. per 1000 cubic feet to the bad. In the case of the local authorities' undertakings, the variation over the same periods was from an average of 2s. 6¼d. to 2s. 6½d.—an increase of only ¼d.

DIAGRAM No. 3.—GROSS RECEIPTS, EXPENDITURE, AND PROFIT, PER 1000 CUBIC FEET OF GAS SOLD, FROM 1887 TO 1903.

BLACK COLUMNS ARE FOR COMPANIES, SHADED FOR LOCAL AUTHORITIES.



On the other hand, the total average receipts per 1000 cubic feet of gas, remained steady at 3s. 9d. for the companies, while to the local authorities it dropped from 3s. 4¼d. to 3s. 3½d.—being a shrinkage of ¾d. The differences between the receipts and outgoings, of course, constitutes the gross profit, which in the companies' case fell from 12½d. to 10¾d., and in that of the local authorities dropped from 10d. to 9d. Meanwhile, the amount of capital investment necessary to carry on the business rose (for the companies) from an average of 12s. 11½d. to 15s. 9½d. The latter average figure, it must be noted, includes a nominal increase due to conversion. For the local authorities, the capital per 1000 cubic feet fell during these periods from an average of 13s. 6½d. to 12s. 4d.

DIAGRAM No. 4.—GAS UNACCOUNTED FOR, PER CENT. OF MAKE AND PER MILE OF MAIN.

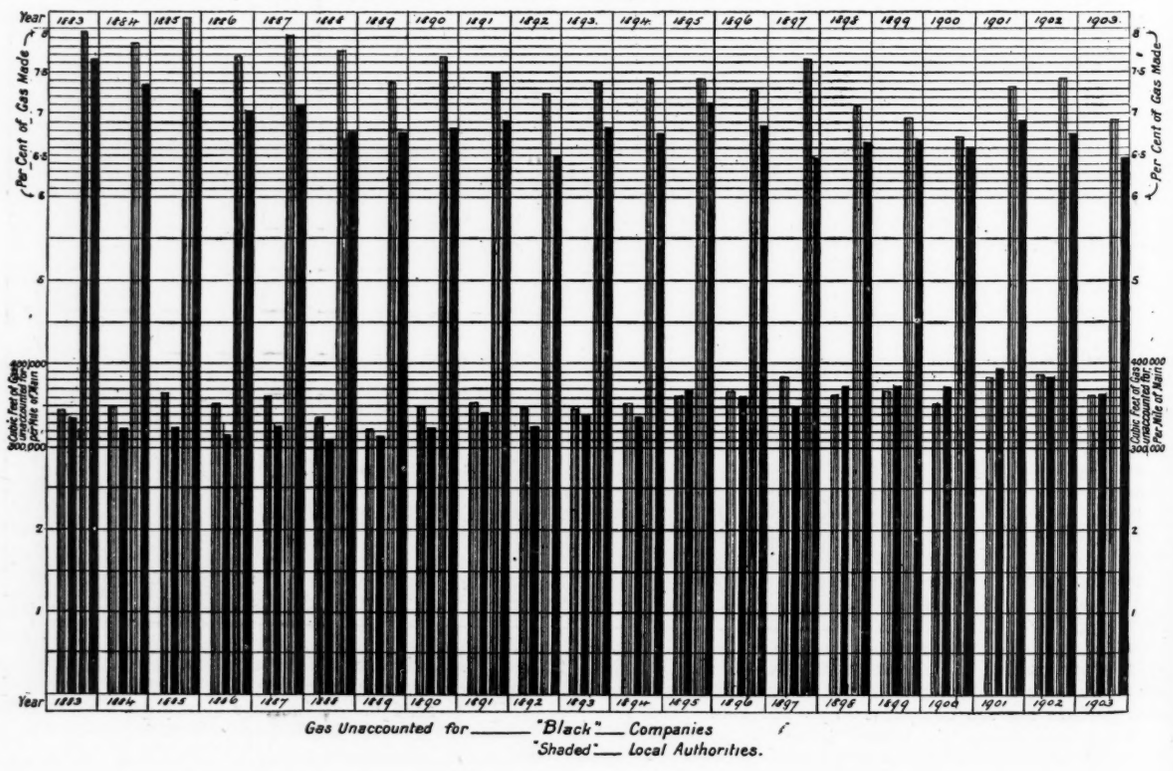
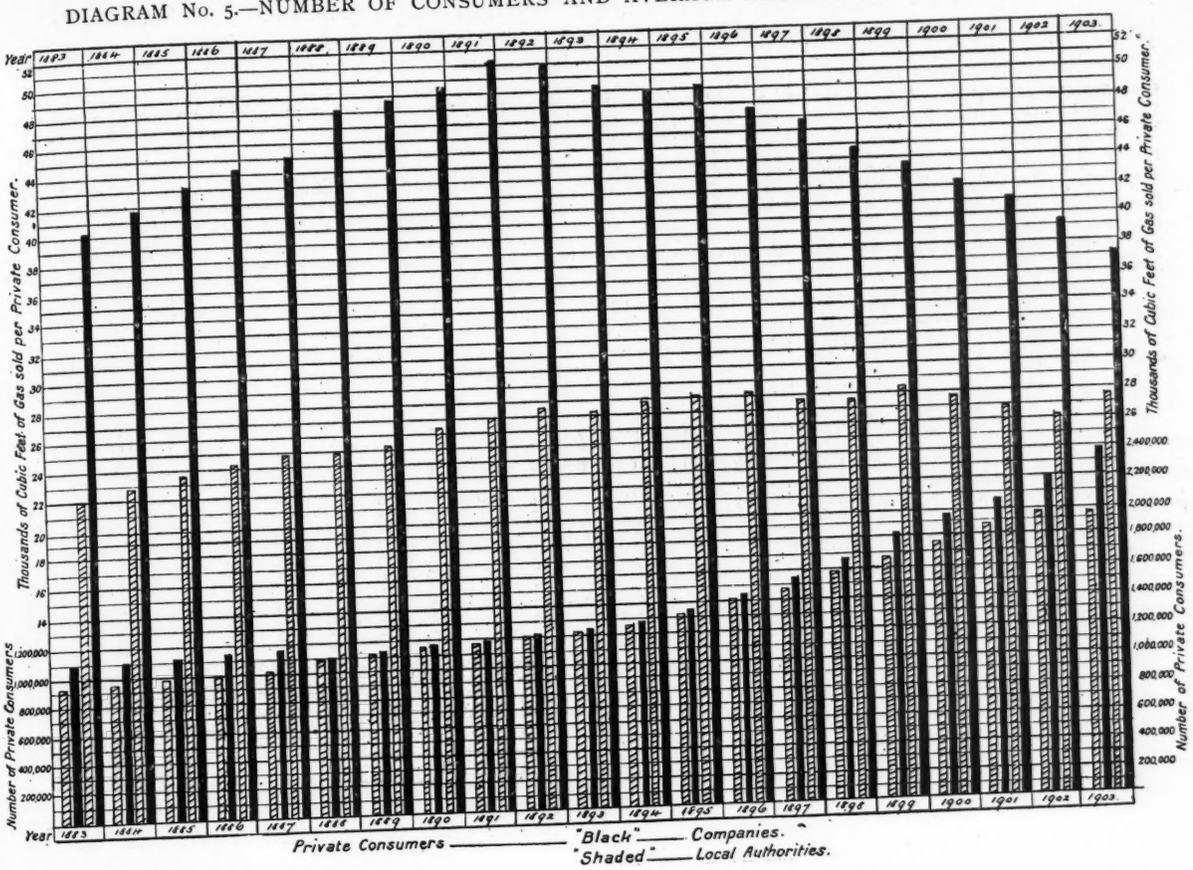

Year
1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903
Per Cent of Gas Made
Cubic Feet of Gas unaccounted for per Mile of Main
Gas Unaccounted for — "Black" — Companies
"Shaded" — Local Authorities.

DIAGRAM No. 5.—NUMBER OF CONSUMERS AND AVERAGE AMOUNT OF GAS CONSUMED.


Year
1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903
Thousands of Cubic Feet of Gas sold per Private Consumer.
Number of Private Consumers.
Thousands of Cubic Feet of Gas sold per Private Consumer.
Number of Private Consumers.
Private Consumers
"Black" Companies.
"Shaded" Local Authorities.

Perhaps, however, the most striking as well as reliable analysis can be instituted in respect to the business of the local authorities, which has not suffered any financial disturbance such as that resulting from the stock consolidations of the companies. Here it will be found that the average capital outlay per consumer (counting every public lamp as one consumer), and taking the new business only, has risen from £13 5s. to £18 5s. Seeing also that the consumption of gas per new consumer added has fallen from 33,722 cubic feet during the first period to 25,013 cubic feet in the second period, there is so much less trade per head to pay the higher cost. The mean reduction of gross profits per consumer, due to this smaller demand, was from 28·1s. to 18·76s. The meaning of these figures is that the new business costs more, and brings in less, than the old. It is only as regards the greater security due to the broadening of the basis of the industry, and its fuller fulfilment of its destiny in the service of the public, that its financial aspect can be regarded as more favourable with its growth in volume. The public, rather than the proprietors, have taken the lion's share of all the profits in the new developments that have accrued since 1893. When it is remembered further that one of these influences—the Welsbach light—has given the consumer of gas for illuminating purposes tenfold the value previously received, the gain to the consumer from the changes that have come over the gas industry will be seen to far surpass anything that could have been provided for by Act of Parliament.

These facts bear striking testimony to the wisdom and enlightened commercial intelligence that control the public and private gas undertakings of this country. The returns, taken as a whole, must be considered highly creditable alike to directors, committees, and officials; and it must be admitted that the undertakings of the local authorities compare most favourably with those of the companies, in almost every respect.

The diagrams merely exhibit graphically the facts given in the tables. Diagram No. 1 shows the steady growth of the gas industry during the twenty years. With the single exception of 1893—when the electric light was coming into use in the largest towns—the output of gas, it will be noticed, rises yearly without a break. Even the incandescent gas-light left no definite mark upon this record. Remarkable to relate, the use of electricity for public street lighting gave only a temporary check to the sale of gas for this purpose, which now stands higher than ever.

I cannot refrain from offering a word of congratulation here to the Corporation of the City of London, on their recent decision to improve the lighting of the streets, and save the ratepayers' money, by giving up the costly electric arc lamps, and substituting for them "high-power incandescent gas," which is both cheaper and more effective. Doubtless, the Corporation were better able to follow the dictates of common sense and sound commercial policy in this regard by being free from any trading entanglement of their own, which we know from experience often constrains local authorities to act unfairly and unreasonably both to their own ratepayers and to other undertakings.

With respect to the unaccounted-for gas, shown in the diagram, further experience only confirms the view set forth in 1895—namely, that the volume given is chiefly attributable to discrepancies of measurement, due largely to differences of temperature in the gas in distribution. It does not appear to have increased in proportion to the higher pressure now general, although it must be observed that there is an increase per mile of main in the case of both the companies and the local authorities, as shown on Diagram No. 4. It now amounts to practically 1000 cubic feet per mile of main.

Diagram No. 2 exhibits the capital employed per 1000 cubic feet of gas sold. The black columns indicate the companies, and the shaded columns the local authorities. The point here is the alteration of the relative circumstances of the companies and local authorities in respect to capital outlay per 1000 cubic feet of gas sold. Whereas, at first, the local authorities overtopped the companies (which condition lasted until 1892), in that year the change began to manifest itself. The local authorities continued to reduce; and this condition prevailed until 1899, when the minimum of 11s. 7½d. per 1000 cubic feet of gas sold was marked. From that year to the present, the capital has again increased —attaining in 1903 the figure of 12s. 10¼d. per 1000 cubic feet of gas sold. The companies' capital did not greatly vary between 1887 and 1898; but then a large increase appeared, mainly due to the conversion of stock. This

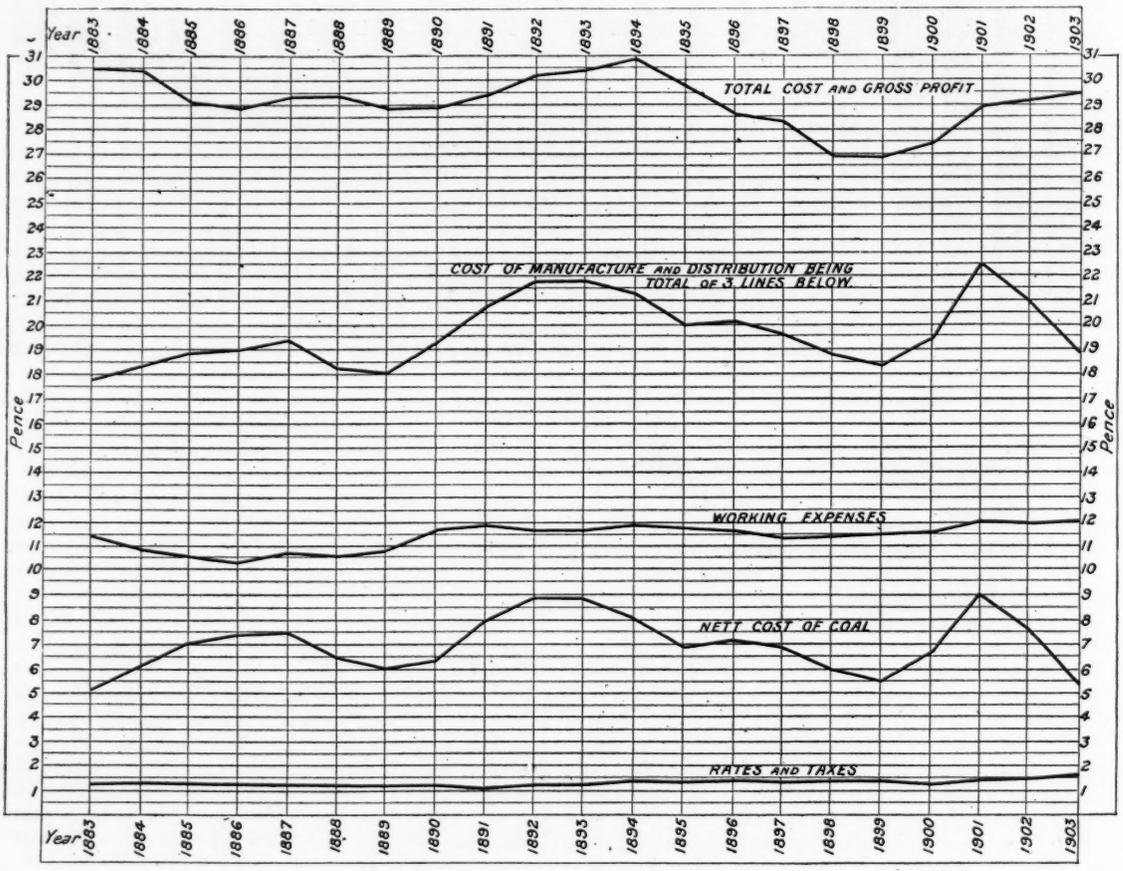
increase is steadily going on, on an almost exactly parallel line to that of the local authorities—thus proving that the same influences governing this expenditure are affecting both classes of undertakings.

Diagram No. 3 shows receipts, expenditure on revenue account, and gross profit, per 1000 cubic feet sold, of the two classes of undertakings from 1887 to 1903. Here it is observable that the companies' receipts (which include residuals) have preserved a remarkable approximation to uniformity throughout the period. This fact appears the more striking in the averages for the first and second Septenniums chosen, which work out the same to a fraction—namely, 3s. 9d. per 1000 cubic feet. With respect to the local authorities, the same remark generally applies, with the difference that the total receipts from gas are in a round figure 5d. per 1000 cubic feet less than those enjoyed by the companies; and the second septennium shows a diminution of ¾d.

Diagram No. 4 shows the unaccounted-for gas per cent. of make and per mile of main.

Diagram No. 5 displays very strikingly the relations existing between the number of private consumers (not including public lamps), and the average consumption, for the two classes of undertakings, and for every one of the past twenty years dealt with. It will be noted that the number of private consumers keeps nearly equal for these undertakings from the beginning up to 1895, after which time the companies drew ahead, until they surpassed the local authorities in 1903 by nearly half-a-million altogether. There always was a great difference between the quantity of gas consumed by the individual customer of a local authority and of a gas company. In 1883, the average for the former was 22,048 cubic feet, while for the latter it was 40,329 cubic feet. This kind of difference continued until 1891, when the companies' customers consumed 51,223 cubic feet, and the local authorities' customers had only risen to 27,058 cubic feet.

DIAGRAM No. 6.—AVERAGE COST OF MAKING AND DISTRIBUTING GAS (PER 1000 CUBIC FEET SOLD) BY THE PROVINCIAL COMPANIES AND CORPORATIONS, FROM 1883 TO 1903. (FROM "FIELD'S ANALYSIS.")

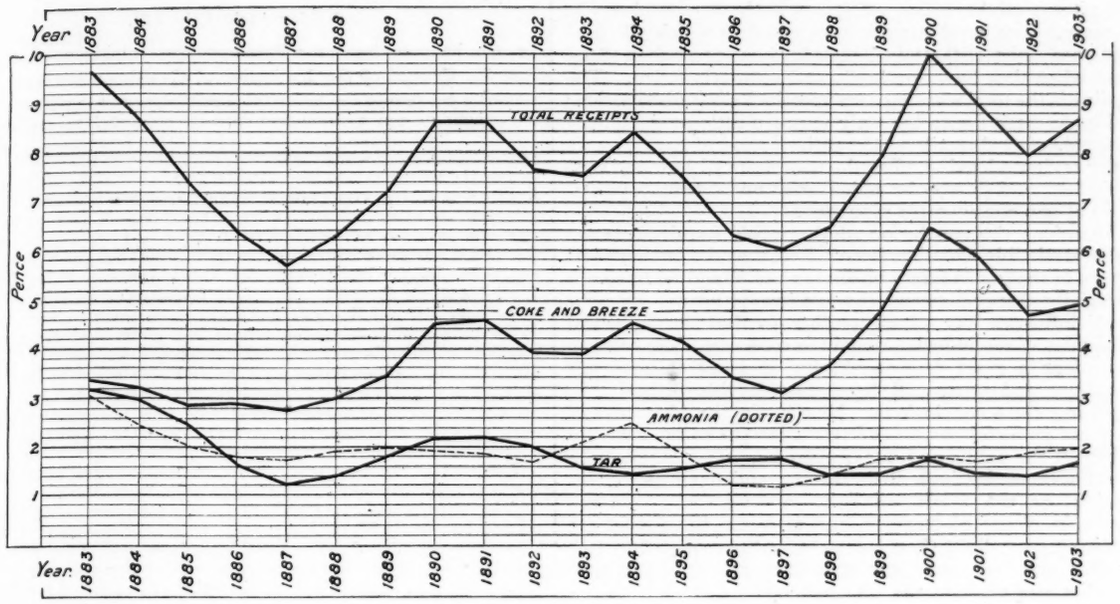


Since that date, the volume of the demand of the companies' customers has gradually diminished and is steadily approximating towards the scale of the *per capita* business of local authorities. It is, of course, clear why these phenomena should appear—being caused by the growing similarity of the demands upon the two classes of undertakings, once so different.

Diagram No. 6 shows the expenditure-line on Diagram No. 3, dissected into five items—to show more particularly the nature and incidence of the chief expenses incurred in gas manufacture. These are based upon the average results appertaining to the provincial companies and local authorities included in "Field's Analyses," covering a period of twenty years. They are highly significant of several important cardinal truths that govern our industry, almost independently of anything that individuals can say or do to control the issue. This may be a rather humiliating admission, coming after all the talk about progress and improvement in the science and technic of gas manufacture, gas works design and construction, the advance of mechanics and chemistry, and the general daily uplifting on the wings of mathematics and physics—not to mention puffery and advertisements of scores of proprietary devices for making cheaper gas.

Take the bottom line—rates and taxes. This is an incompressible expense, which is rapidly increasing, especially in the case of some undertakings, and in the course of another year or so will be much heavier, so that no relaxation is to be hoped for under this heading. The next line indicates the net cost of coal; and we need not look farther for the paramount influence that rules the economy of production. For this expresses the sum of all the administrative ability, commercial aptitude, and efficient management of the works and plant. It is, of course, subject to the variations of the market, both as regards buying and selling, and also to the conditions of the manufacturing equipment. It is, moreover, materially affected by the geographical situation of the works—a fact which amateur critics would do well

DIAGRAM No. 7.—AVERAGE RECEIPTS FOR RESIDUALS (PER 1000 CUBIC FEET OF GAS SOLD) BY THE PROVINCIAL COMPANIES AND CORPORATIONS, FROM 1883 TO 1903. (FROM "FIELD'S ANALYSIS.")

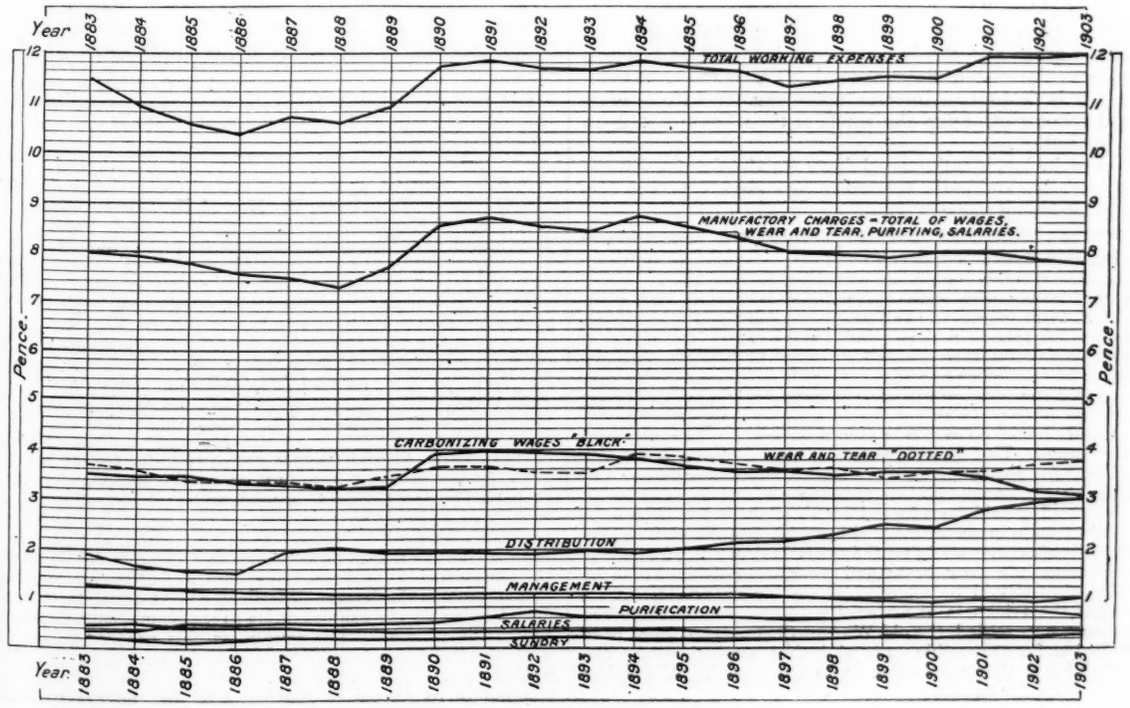


to remember. The third line represents working expenses; and as this element of cost is further dissected in a separate diagram, it need only be remarked that the average charge has remained singularly level throughout the last thirteen years. Its tendency, however, is distinctly upwards. The fourth line indicates the sum-total of the three lines beneath it; and the fifth line has the gross profit added.

Diagram No. 7 is an analysis of the return from residuals. Shortly, it shows that coke and breeze are the dominating products whose market value practically always follows that of coal, and exercises the principal influence in fixing the net cost of the raw materials of gas manufacture. Another salient feature is the absence of any sign in the tar-line of the great developments of the fine chemical industries, which is generally asserted to be a mine of wealth to the gas-maker. As a matter of fact, the value of tar to the gas-maker has declined during the past twenty years.

Diagram No. 8 shows the average working expenses per 1000 cubic feet of gas sold, and is the further analysis mentioned above. This is where the efficiency of the management is mainly prominent. The most notable feature is the steady rise of the expense of distribution, which has increased from an average of 1½d. per 1000 cubic feet in 1885, to 3d. per 1000 cubic feet in 1903. Sundries—salaries, management, and purification—are practically stationary. Carbonizing costs, which jumped up in 1889 (at the era of the appearance

DIAGRAM No. 8.—DETAILS OF THE AVERAGE WORKING EXPENSES (PER 1000 CUBIC FEET OF GAS SOLD) BY THE PROVINCIAL COMPANIES AND CORPORATIONS, FROM 1883 TO 1903. (FROM "FIELD'S ANALYSIS.")


Year
1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903
Pence.
TOTAL WORKING EXPENSES.
MANUFACTORY CHARGES = TOTAL OF WAGES, WEAR AND TEAR, PURIFYING, SALARIES.
CARBONIZING WAGES "BLACK."
WEAR AND TEAR "DOTTED"
DISTRIBUTION
MANAGEMENT
PURIFICATION
SALARIES
SUNDRY

of the New Unionism), have been brought down steadily again to a lower point than ever, by the introduction of stoking machinery and labour-saving methods and appliances. Wear and tear seems to have been at its maximum in 1894; but after a slight easing off, it again shows a tendency to increase. The total manufacture costs (in which all these items are embraced) attained their high-water mark in 1894; since when they have gradually and regularly fallen. The top line is the total working expenses, including distribution; and its average figure has only varied a little over 1½d. per 1000 cubic feet throughout the entire period of twenty years under review—leaving off at the maximum of 12d. per 1000 cubic feet, and (it may be added) with no immediate probability of any considerable reduction.

Therefore, the conclusion of the whole inquiry appears to be irresistibly what has been stated, that the fundamental factors of the gas industry of the United Kingdom have not materially changed during the last twenty years. One internal influence has set off another, so that the industrial economics of the industry remain *in statu quo*. We seem to have done a great deal of running in order to keep our standing; and some will have considerable difficulty in accepting these conclusions. Meanwhile, the advantage of the most powerful outside influences has gone almost wholly to benefit the public and our consumers. The turn of the investment market is in their favour; and the fruits of invention—as the Welsbach light—are all theirs. In the streets, in places of business, and at home, the public get ten times more light than formerly for the money they pay for gas; and they benefit far more in every way than we do from the uses made of gas, by prepayment meters, in reducing household labour, and the generation of power. There is no immediate prospect that I can see of any material alteration of the economy of the industry whereby the cost of gas delivered at the consumers' meters could be substantially reduced. Such fancies as the cheap 8 or 9 candle gas, of great heating power—imagined to be the need of the age by the Royal Commission on Coal Supplies—will not bear the rude touch of statistical truth. There is no such thing in existence; and there is great difficulty in seeing where it is to come from.

Before leaving this subject, I must utter a word of warning against a possible misunderstanding of the statistics. It has been necessary to iron out all individuality, in order to lay down averages; but there is a tyranny of averages which should not be submitted to beyond what is necessary to grasp their broad meanings and general significance. Happily there are exceptions to the rule of the maintenance of the *status quo ante*, which nevertheless is the general condition. Individual undertakings could be named which have changed greatly for the better during the period under review; and a good deal of pioneering work is being done on every side. The mass, however, does not exhibit any change of nature or of direction of motion; but the bulk continues to grow, and the industry broadens out and is prosperous as the current flows around. This is the great truth which it is desired to impress upon you, and leave upon record "footprints upon the sands of time" overpassed by this Institution.

In conclusion, gentlemen, I have to thank you for the very attentive and patient hearing you have given to this somewhat trying address.

Standard Screw-Threads.—The Engineering Standards Committee have recently issued two additional reports (Nos. 20 and 21); one dealing with screw-threads and the other with pipe-threads. With regard to the former, the Sectional Committee, to whom the subject was referred, having satisfied themselves that the Whitworth thread is in very general use throughout the country, took evidence as to other threads, and came to the conclusion that the series of pitches originally devised by Sir Joseph Whitworth were admirably adapted for many engineering purposes, and should be retained for all screws of ¼ inch diameter and upwards. The second report is based upon a draft prepared by the representatives of the British Tube Association; and it contains a recommendation that the existing form of Whit worth thread should be adopted for all pipe-threads for iron or steel tubes made in accordance with a table contained in the report. It is also suggested that the same form of thread shall be used for pipes of copper, brass, and other materials, and that the same pitches should be adopted where the outside diameters agree and the thickness of material permits. In the simplified dimensions now settled, the old Whitworth standards have been preserved as far as possible up to 2¼ inches nominal bore. The report also contains regulations as to the screwing of couplers and screwed connections.

THE INSTITUTION OF GAS ENGINEERS AND THE LONDON GAS BILL.

A Petition Against the Bill.

It will be seen by our "Parliamentary Intelligence" to-day that the Council of the Institution of Gas Engineers have presented a petition to the House of Lords against the proposed re-enactment of the 5 cubic feet rate of consumption method of testing. This marks a further stage in the development of the opposition of practically the entire gas industry to this reactionary proposal; and it is not improbable that, at the meeting of the Institution which commences to-day, and consequently before this number of the "Journal" has been issued, a communication will be made as to the further steps that the Council have deemed it advisable to take in the interests of the gas industry in this connection. The London Gas Bill is expected to be before Lord Newton's Committee in a very few days; and it is greatly to be hoped that full opportunity will be given for all objectors to be heard, without undue weight being given to the recommendation of the Departmental Committee of the Board of Trade. How this recommendation ever came to be made is the more surprising the more the idiosyncrasies of the "London" No. 1 argand burner are inquired into; and how any gas man with even a moderate amount of experience of gas testing could have committed himself to such a proposal, passes belief.

However, it has been made, and those concerned must make the best fight they can against it, so as to undo the mischief to which, unfortunately, a highly respected member of the gas industry has made himself a party. It is anticipated that some interesting additional evidence will be given against the proposal—in fact, testimony as to the untrustworthiness of the 5 cubic feet rate of consumption method may be said to be accumulating daily. The petition of the Institution is truly a weighty indictment of it, and carries with it conviction of the strength of their case. This is indeed unanswerable, except by a dumb appeal to the recommendations made by the Board of Trade Committee, as adopted by the London County Council before Mr. Cawley's Committee in the House of Commons. There is no statement in the petition which cannot be substantiated by evidence; and there can be little doubt that it expresses the opinion on the subject of practically the whole of the members of the Institution, who may be expected to heartily support the vigorous action of the Council, To them the matter is of importance, because, as stated in the petition, the method of testing gas adopted with respect to the London Companies is usually applied to companies whose areas of supply are situated in other parts of the United Kingdom. In fact, in the case of several Acts of Parliament relating to Provincial undertakings, it is provided that the method of testing shall be the same as that adopted in the case of the London Gas Companies. To the latter it is of immediate, and it may be said also of immense, importance, seeing that the effect of the proposition would not only be to mark down the illuminating power of their gas from 14 to 13 candles, but would also compel them to make and supply a higher quality of gas for the reason that, as demonstrated by Mr. W. J. Dibdin's experiments, the 5 cubic feet rate of consumption cannot be relied upon even for mere identification purposes. It is seldom that a more utterly unscientific proposal has emanated from any Committee; it is simply astounding that so glaring a blunder should have been made by a Committee constituted, as was this Departmental Committee, of experts of established reputation. The issue may, however, be awaited in the confident hope and expectation that right will prevail.

In the opening paragraphs of the petition—which is signed by Mr. D. Irving (President), Dr. Harold G. Colman (Member of Council), and Mr. Walter T. Dunn (Secretary)—it is pointed out that the Bill is to "amend the Acts relating to the supply of gas in London, and to make further provisions with reference thereto;" and that the petitioners are a body, incorporated under the Companies' Acts, comprising practically all the gas engineers and managers of gas undertakings in the United Kingdom. They therefore claim to represent and to voice the opinions of the entire gas industry of the country. The petitioners go on to say that the Bill contains (*inter alia*) provision altering the methods of testing the gas supplied by the Gaslight and Coke, the South Metropolitan, and the Commercial Gas Companies, as at present regulated by statute; and that by clause 3 it is proposed to provide that the burner for testing the illuminating power of the gas supplied by the London Companies shall be Sugg's "London" argand, and that in testing the gas such burner shall be used with a chimney 6 inches long by 1⅜ inches internal diameter. It is also proposed that the gas supplied by the South Metropolitan and Commercial Companies shall be such as to produce, when consumed at the rate of 5 cubic feet an hour in the burner described, a light equal to that produced by 13 sperm candles of six to the pound, each consuming 120 grains an hour. The petitioners next proceed to say that while the Bill is one which primarily deals with the London Companies only, it affects also a very large number of other gas companies, by reason of the fact that the method of testing

adopted with respect to the former is usually applied to those whose areas of supply are situate in other parts of the United Kingdom. In fact, in the case of several Acts of Parliament prescribing the method of testing gas manufactured by Provincial Companies, it is expressly provided that it shall be the same as that adopted in London.

The primary object of the Bill, so far as it affects the petitioners, is to prescribe a method of testing which shall be applied to gases of all qualities; but the petitioners submit that the one proposed is "objectionable," and "prejudicial to the interests of manufacturers of gas." They point out that the quality and composition of the gas supplied in various parts of the country differ very widely; and if a uniform method of testing is to be adopted, they respectfully submit that it should be one which is capable of "representing accurately the true relative value of gases of different illuminating powers and manufactured by different processes and from different substances." They submit that the method proposed by the Bill is altogether unsuited for testing gases of different qualities and compositions, and that the only correct principle to be followed is that of burning the gas at such a height of flame as will best develop the greatest efficiency of the gas in the standard burner used for the time being. The petitioners viewed with satisfaction the partial recognition by Parliament of this principle in the South Metropolitan Gas Act, 1900, and the Commercial Gas Act, 1903, of which last-mentioned Act the operation is limited to three years. They, however, submit that, though the method of testing adopted in these Acts is appropriate for gas made entirely from coal, having an illuminating power of 16 or any less number of candles, it is not adapted for testing accurately gases of other compositions or of higher illuminating power. In various other Acts—such as the West Ham of 1902, and the Derby, the Hampton Court, and the Walker and Wallsend Union Acts the following year—practically the same principle was followed.

The petitioners further submit that the proposal to test gases of all compositions and qualities by consuming them in the standard burner at the uniform rate of 5 cubic feet per hour is "unscientific and unjustifiable;" and they respectfully ask that the proposal should not be sanctioned. They say it is an admitted fact that, in order to obtain the greatest efficiency from gas, of whatever quality or composition, it is necessary that the proper proportion of air should be permitted to mix with it; and that as the quality and composition of the gas vary, so must the quantity of air. For example, in the case of gas of any lower quality than 16 candles, or of a mixture of coal gas and carburetted water gas (which requires less air for consumption than gas made from coal only), whether of 16-candle power or less, the quantity of air permitted by the standard burner to mix with gas consumed at a fixed rate of 5 cubic feet per hour is in excess of the amount required for perfect combustion, and the illuminating power is depreciated.

The petitioners submit that the fact that the method proposed by the Bill is not adapted for testing accurately gas of an illuminating power of 14 candles, is recognized by the promoters, who propose by clause 4 to provide that, when tested by this method, the gas supplied by the South Metropolitan and the Commercial Companies (which is 14-candle gas) shall give a light equal in intensity to that produced by 13 candles. They, however, submit that the under-valuation of illuminating power in the case of 14-candle gas under the proposed test exceeds one candle; and that as the quality of the gas becomes lower, the rate of increase of the under-valuation exceeds the rate of decrease of illuminating power—thus increasing the liability to penalties for apparent deficiency. They further submit that the proposed method is not adapted for the testing accurately of gas of any illuminating power less than 16 candles; and they accordingly object to it.

The petitioners conclude by saying that, being convinced that the only fair method of testing gas of all descriptions in the standard burner is to consume it at such a rate that the height of the flame is uniform, they have made careful investigations and experiments to ascertain what such height should be, and they are satisfied that practically accurate results are obtained, whatever the quality or composition of the gas may be, by consuming it in the standard burner at such a rate that the height of the flame is $3\frac{1}{2}$ inches. It is urged by the County Council, in support of their proposal, that the Departmental Committee appointed by the Board of Trade recommended the adoption of the method of testing proposed by the Bill; but the petitioners express the belief that the effect of the recommendation was not fully appreciated, and experiments made since the inquiry by the Committee have confirmed them in the opinion that the method is erroneous. They submit that the results of more recent investigations show that the method recommended is not one which should be adopted by Parliament and be made permanently binding, as proposed by the Bill. Finally, they submit that the preamble of the Bill is unfounded, and cannot be substantiated by evidence.

The "Journal des Usines à Gaz" states that alcohol, when carburetted for use as an illuminant, is inferior to petroleum employed for a similar purpose, and is never likely to become a serious competitor with it for lighting, because in highly-carburetted alcohol, containing naphthalene, there is always a certain percentage of carbon, which is much less volatile than the alcohol.

THE INVERTED BURNER PATENT.

After a hearing of four days, before Mr. Justice Joyce, in the Chancery Division of the High Court of Justice, the case of *The New Inverted Incandescent Gas-Lamp Company, Limited, v. The Globe Light, Limited*, was decided in favour of the defendants. This is a matter of some importance to the gas industry, inasmuch as it makes for freedom in regard to a type of burner which has recently come rather largely into favour on account of certain advantages which it secures to gas in the competition of the latter with incandescent electric lighting. The action was brought for alleged infringement of the patent held by the plaintiff Company, under which they manufacture and supply their well-known inverted burner. The infringement was not only denied by the defendants, but they also alleged want of novelty and prior publication. The latter, however, was not pressed; and the learned Judge did not, therefore, touch further upon the question of validity beyond saying that he had some doubts about it.

On the question of infringement, upon which the defendants rested their case, it is not very easy to discover, from the evidence called on behalf of the plaintiffs, of what the alleged infringement consisted; and on the conclusion of their case the learned Judge said he should want to know exactly what the invention was, and what was the infringement alleged. It does not seem to have been difficult for the defendants to satisfy his Lordship that the burner manufactured by them differed in some important respects from that which is made by the plaintiffs. The latter claim to use an isolator, made by preference of china, by which the mixture of gas and air is kept cool in its passage to the burner head, and a deflecting cone upon this isolator, which serves the double purpose of diverting the hot products of combustion from the burner, and preventing them from being sucked in by the gas instead of fresh air. It was, however, made clear that the defendants do not use an isolator, but instead a third metal tube, nor any deflecting cone upon an isolator, because they have no isolator, nor any cone at all. The burner has, indeed, a circular metal plate which might to some extent act as a deflector; but this, not being in combination with an isolator, was no infringement. The defendants further claimed, and apparently with success, that their burner is in reality a regenerative burner; their aim being in this respect the very opposite of the plaintiffs'—namely, to heat the mixture of gas and air in its way to the burner head, instead of trying to keep it cool, as the plaintiffs did, more or less effectually, so as to prevent any lowering of its velocity, and consequent lighting-back.

Some interesting evidence was given by the defendants as to the alleged difficulty of working a bunsen burner in an inverted position. Mr. G. C. Marks showed photographs of some results obtained with an ordinary "C" burner, which, inverted, and the gallery fastened with a wire so that it should not fall off, burned for thirteen hours with the flame at the nozzle, and did not light-back. An ordinary mantle was then attached to it; and it continued to burn properly, the mantle being partly incandescent. An ordinary laboratory bunsen burner was similarly experimented with, and, after adjustment of the nipple, it burned properly. With a suitably-shaped basket mantle, it burned for six days continuously and satisfactorily.

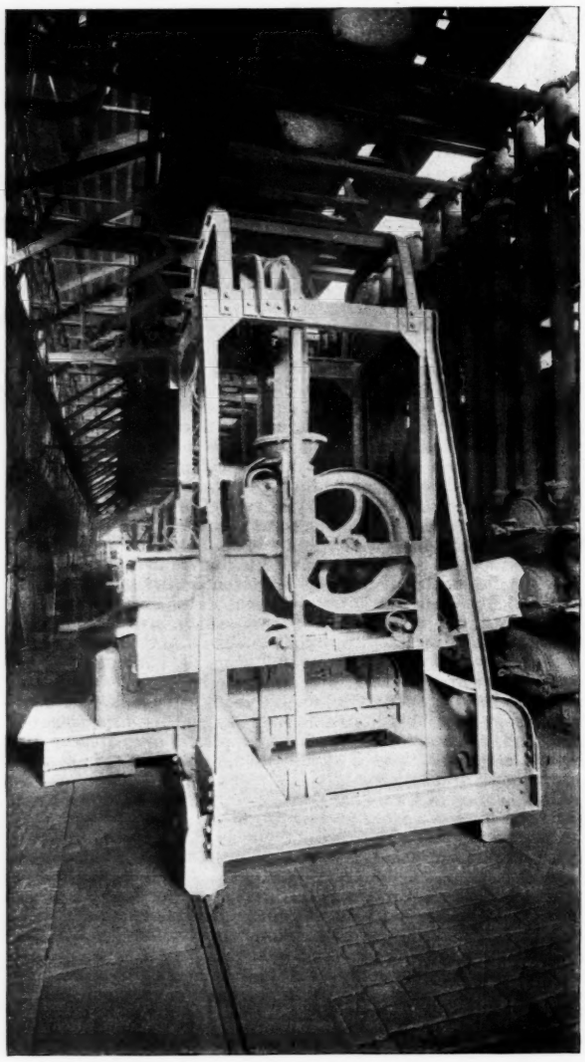
All this goes to show that there is no very great difficulty in getting a bunsen burner to work in an inverted position, given the necessity for it. The idea of doing so had occurred to many inventors prior to the date of the plaintiffs' patent; but success depended upon a combination by means suitable to the end in view. That the plaintiffs' was the first successful inverted incandescent gas-burner is hardly disputed; but this is not always of itself sufficient proof of originality. It is to be hoped that although their claim to possess a monopoly has been disallowed by the result of this trial, a substantial reward for enterprise which has done much service to the gas industry may still be theirs.

Last Thursday, the University of Cambridge conferred upon Mr. Robert Stephenson, J.P., the degree of M.A., *honoris causâ*, in recognition of the sterling work he has performed as a local administrator for the causes of agriculture and education. There are two reasons for recording the event in our columns. In the first place, we understand that Mr. Stephenson is the first to be honoured by the University in this manner; secondly, he is Chairman of the Newmarket Gas Company, and until last year held a similar position on the Cambridgeshire County Council. Those of our readers who attended the meeting of the Eastern Counties Gas Managers' Association at Newmarket in 1903 will have a pleasant recollection of Mr. Stephenson. He presided at the luncheon to which the members of the Association were invited by him and his co-Directors, and subsequently spent the entire day with them, and made the personal acquaintance of many. All who know him acknowledge that the honour he has just received is thoroughly deserved; and the conferring of it will, we are sure, be a source of gratification not only to the members of the Association and to Mr. Stephenson's co-Directors, and the officials and shareholders of his progressive Company, but to a large number of friends engaged in the gas industry.

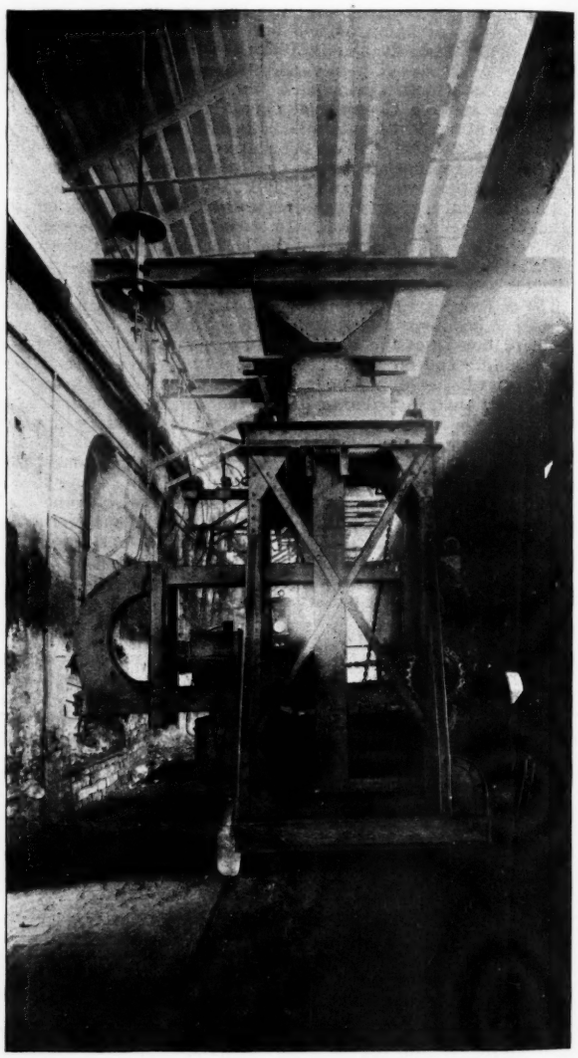
NEW METHODS AT STOCKTON-ON-TEES.

Last Friday was a day of great interest at the Stockton-on-Tees Corporation Gas-Works; and, for our readers as well as ourselves, that interest has its personal as well as its technical side. It is now 37 years since Mr. William Ford went to take up the engineering and managerial duties at Stockton; and those of his friends who have had opportunities of judging of his work for the borough from an outside and disinterested point of view, know how that long span of years has been devoted faithfully to the interests of the town. But, to an extent, he has laboured for some years under disadvantages. The works were designed and built many years ago, and their disposition and strength of structure were such that it is manifest to all who are acquainted with these things that no thought crossed the mind of the original designers —how could it ?—as to the possibility of gas-works plant ever attaining its present economic pitch, and as to the structural plans of that day being unsuitable for the developments of later years.

It will be seen presently that what we have principally to talk about in this article is the large retort-house; and that retort-house is a sufficient example of our point. It is a house thick of wall, and low pitched—too good for thought (so the Corporation Gas Committee determined) of bringing any part of it to the ground; but between benches and outer walls, the working space is narrow. Twenty years ago, the heads of the Engineer and a certain eminent designer of machinery were put together to see whether their joint efforts could not fit mechanical stoking appliances to the house without touching the fabric; and intermittently since then there has been a struggle between brain and the inconveniences of that house for superiority. It, however, remained for modern invention to solve the knotty problem; and when the



The "De Brouwer" Charging-Machine.



The "Jenkins-De Brouwer" Discharging-Machine.

De Brouwer machinery came on the market, Mr. Ford saw that here was anyway a chance for relief. Inquiries resulted in the Gas Committee and Gas Engineer visiting several works; and so pleased were they with what they saw, that they determined if the house could be made to accommodate it, without spending money on the structure, they would have coal and coke handling plant and the De Brouwer machinery installed. Tenders were invited on conditions prepared by Mr. Ford; and six competitive designs were submitted. Drakes Limited were the successful offerers for all the coal and coke handling plant; and Messrs. W. J. Jenkins and Co., Limited, for the charging and discharging machines. It was their work that was inaugurated by the Chairman of the Gas Committee (Alderman John Harrison, J.P.) on Friday, in the presence of the Mayor (Mr. Frank Brown, J.P.) and the members of the Council. During the carrying out of this extensive work, Mr. Matt Dunn, the Deputy-Engineer, has been the responsible superintendent; and, at the same time, he has designed a complete new range of workshops and has seen their satisfactory completion, as well as—acting, of course, in collaboration with Mr. Ford—made other important rearrangements on the works. At the opening, Mr. Ford made handsome recognition of the indefatigable energy of his deputy.

Description of the New Works.

Entering the retort-house one is at once struck with the narrowness of the house between the benches and the outer walls, and the lowness of the roof; and the scheming and restriction that Engineers and Contractors have had to struggle with is immediately remarked. Of course that restriction has to an extent had some effect on gaining the fullest advantage from the coal-handling plant, in view of the limitation in the capacity of the overhead hoppers; and the freedom of operation during charging and discharging is also affected, seeing that even the Jenkins-De Brouwer discharging-machine occupies all the available space between the walls and the benches. If it were not for the old coal recesses in the walls and entrances, there would really be greater inconvenience than there is during the travelling of the machines. But though this is a disadvantage now, it is not one that troubles any

one much, in view of the considerable gains down to the perhaps minor one of having a retort-house floor clear from coal on both sides. The house has narrow coal stores or bins on each side, with a railway line in each raised some 6 or 8 feet above the level of the retort-house; and the coal, when unloaded from the waggons, formerly passed through arches on to the stoking-floor without any further trimming. Of course, this was an admirable arrangement for scoop or shovel; but, as we have stated, on the testimony of Mr. Ford, prior to the arrival of the De Brouwer form of projector, the house was quite unsuitable for machine work. As the arrangement at Stockton is being examined, the mind is irresistibly directed to considerations of the flexibility of this type of machine. Its applications so far seem to indicate —and particularly this one at Stockton—that it would be an exceedingly ill-designed structure to which it could not be applied. There are brought to memory many retort-houses in England of extremely substantial construction, designed by the Thomas Hawksley school of engineers, which look good for a century's work yet so far as the shell and roof are concerned, but which, on account of cramped conditions, were altogether out of date for modern methods without heavy structural alteration, until quite recent times. It must be a source of relief to many engineers having such retort-houses in their possession to realize that they need no longer contemplate the bracing of their nerves to meet the very disagreeable task of advising their shareholders to demolish splendid buildings which represent large sums of money, and are a legacy from less strenuous times. However, these are thoughts by the way; but it should be said, to avoid mistake, that the Stockton retort-house, while of the proportions of those referred to, was designed by Mr. Ford in the early years of his long tenancy of the engineership here.

Although the coal and coke plants and the charging and discharging machinery were divided between the two firms named, there can be no division in our description, as the one contract supplied the plant that is intermediary in the functions of the two distinct plants forming the subjects of the other contract; so that we will deal with the plants in their proper sequence. The preliminary remarks, however, should be made that in the retort-house there are 20 beds of eight Ω retorts, 21 in. by 15 in. section, by 20 feet through, that the heating is done by regenerative furnaces in the basement below the ground floor, that the coal gas producing capacity is 2½ millions per day, and that there is on the works a carburetted water-gas plant of Humphreys and Glasgow's build, equal to half a million cubic feet a day.

Now first as to the coal plant. The coal is brought direct to the end of the coal-stores on an overhead railway from the North-Eastern main line, and is delivered into a receiving-hopper fixed over the breaker, which has been constructed at the end of the store beneath the railway, so that the coal from the waggons drops directly into it. The breaker is of the four-roll type; and reduces the large coal to 2-inch cubes. It may be mentioned here that the breaker and the whole of the remaining coal plant is driven by a Crossley gas-engine of 20 brake horse power fixed in an adjoining basement room. From the breaker, the coal is delivered into a 12-inch bucket elevator of the lattice braced type, which raises the coal to a height of 30 feet, and delivers through a shoot on to an endless 20-inch wide six-ply cotton belt conveyor (about 240 feet long), which is provided with a movable tipping carriage for delivering the coal at any required point into the storage hoppers. An examination of the overhead work shows the difficulties that have had to be negotiated above the retort-bench. The want of head-room has necessitated the fixing of the belt conveyor quite in the roof; and for the full length of the house, a platform has been arranged along the roof principals. The coal storage hopper is continuous the length of the twenty beds; and each bunker in the hopper is fitted with three measuring chambers for each bed—that is to say, one opposite each vertical tier of retorts. The necessary limitation of the dimensions of the bunkers makes them hardly capable of holding a full twelve hours' supply; so that really, to have something in hand, their replenishing is needed three times in the twenty-four hours. The capacity of each coal-bunker over each bed is about 3½ tons. The measuring-chambers are adjustable, but charges of 5½ to 6 cwt. are the rule. The inlet and outlet doors of the chambers are worked by hand levers and gearing placed along the back wall of the house. The whole of the moving coal plant is arranged for a capacity of 30 tons per hour; and this we say, judging from what has been seen, is well within its capability. From beginning to end, the workmanship of the plant is all that can be desired; and, under the adverse conditions to the making of a good job, Drakes Limited have done exceedingly well in the execution of their task.

Well now we come to the charging-machine, which (as has been said) is of the De Brouwer type. The projector has been so frequently the subject of description that special reference here is not required; but it should be stated that, in this case, it is guided and held between turned guide-bars, and is not free to swing on chains. It is carried on a frame with wheels running on rails in the floor of the house. The machine is propelled and the projector is hoisted from tier to tier by an electric motor connected with gearing in a cast-iron frame on one side of the main frame. The propelling motor is of 6⅔-horse power, and the charging-motor of 4-horse power. The coal from the measuring-chambers reaches the band of the projector through the usual telescopic shoot, and is then charged into the retort. The charging-machine has been at work since the middle of January, and (it may be conveniently mentioned here) the discharger for six weeks, since which time the ordinary stokers have been on the work. They have expeditiously learned to handle the machines, and we can only speak of their work with praise. The charging-machine was working in an extremely quiet, smooth, and easy manner; and was putting into the retorts the 6 cwt. or thereabouts of Durham coal in layers which it would be difficult to beat. Mr. Ford and Mr. Dunn both spoke of their great satisfaction in this regard. And these charges were seen put in under ordinary working, as well as during the visit of the Committee. in about 24 seconds each! We are informed, as another point of interest, that since the machinery has been at work, the make of gas per bed has largely increased; and no counterbalancing trouble has been experienced. Another matter might be mentioned which bears upon the working of both the charging and discharging machine. It is this, that the retorts have been in use now nearly three years—two winters, and this is the third summer. The hand rake work has somewhat battered the floors of the retorts near the mouthpieces; but it is calculated that, with a little repairing work, and the gentle usage of the retorts by the machines, the retorts are good for considerable service yet, and that in the future the cost of retort maintenance will be materially reduced.

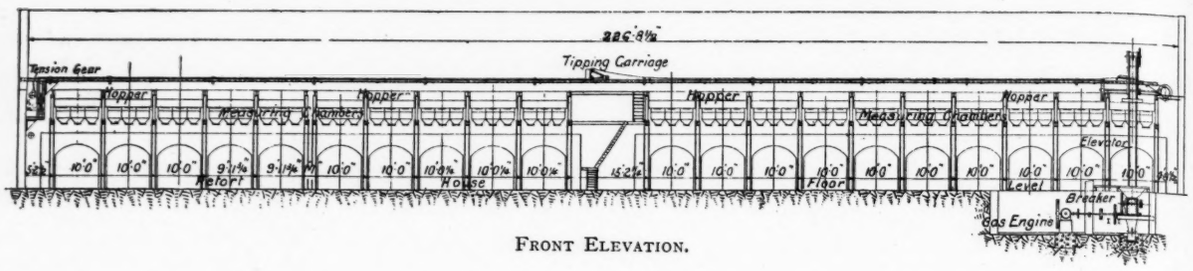
Attention is now diverted to the discharging-machine, which is of the "Jenkins-De Brouwer" type, consisting of a telescopic ram operated by Mr. De Brouwer's patent rack chain and water-cooling arrangements. The machine itself is much the same in appearance as the charger; and the frame gearing and motor are mostly interchangeable. As the illustrations show, they are very neat and light in appearance; and yet in their simplicity one gets impressed with their powerfulness and structural strength. In this case, the propelling motor is 6⅔-horse power, and the pushing motor 7½-horse power. The three-fold telescopic ram or pusher portion is suspended by chains, and is guided in the main frame so that it may be hoisted to suit any tier of retorts. The controller is arranged to stop the ram automatically at both ends of the stroke. At separate periods of the day on Friday, it was seen that the operation of discharging a retort did not exceed 30 seconds —the ram being in and out of the retort in that time; and notwithstanding the badly-worn ends of the retorts, the charge was pushed out with the greatest ease, and without the slightest sign of choking. To see coal literally flowing from a retort in large pieces gives one a sensation of pleasure; and the size in which it is placed on the coke-conveyor, gives one an idea of there being an excellent margin between it and breeze before its mechanical handling can reduce it to the latter undesirable state.

The two machines are electrically driven; and we are reminded by the fact that the current is obtained from the borough electricity works which occupy part of the gas-works site, and that these electricity works were designed by Mr. Ford, and continued under his management until his health broke down. They are now under distinct control from the gas-works. It is, however, from these works that the current is now obtained for driving the "Jenkins-De Brouwer" machines. After passing the usual meters and fuses, it travels to two overhead lines of conductors in the retort-house—each machine carrying a couple of short trolley poles to make contact with the conductor. A question was asked Mr. Dunn, as to the running costs; and the information was readily given that the current was supplied at 1d. per unit. During a month's working of the charger (without the discharger), and with experiment between, 334 units were used; and it is calculated that 10d. a day for each machine is about the average cost of electricity. The discharger uses rather less than the charger. At Blackburn, we believe, the average cost is about 7s. 9d. a week.

Now we have dealt with all the plant on one side of the retort-bench—that is to say the coal-handling plant and the charger and discharger, and, on the other side of the house, there is only the coke-conveyor, with (outside) the distributing and storing plant. With this, we have a retort-house fully equipped machanically, from the reception of the coal to the disposal of the coke. The scheme for the coke plant presented some features of difficulty; and it is seen that it was almost compulsory to take the coke out of the centre of the house in view of the location of the latter, and its relation to the coke ground. This was the scheme of Drakes Limited. There are two patent hot coke-conveyors fixed in the retort-house floor; each conveyor dealing with the coke from ten beds, and delivering into a common hopper in the centre of the house under the ground floor. The conveyor-plates are corrugated, and about 2 feet wide; and it is noticed that, as they pass over the sprocket wheels how neatly they break joint, and when travelling on the flat, how closely they unite. The corrugations, it is believed, give strength to the plates, and certainly they assist in carrying the quenching water along to the end with the coke. The conveyors work in suitable troughs, consisting of channel sides with steel bottom plates, and renewable flat wearing strips, and are protected with steel guard plates the full length of the conveyor.

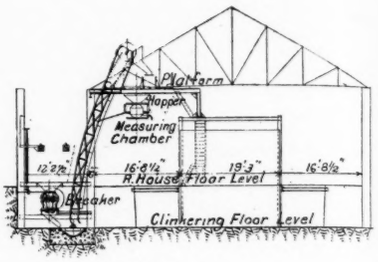
The coke is discharged from the retorts into suitable shoots, which direct the hot coke into the conveyors; and the hot coke is quenched, before entering the central hopper, by sprinklers fixed to the bench buckstays. The coke is then delivered from the receiving-hopper into a circular revolving filling machine in the basement, which feeds the coke into a gravity-bucket conveyor, each bucket being capable of containing about 40 lbs. This

THE COAL-HANDLING PLANT.

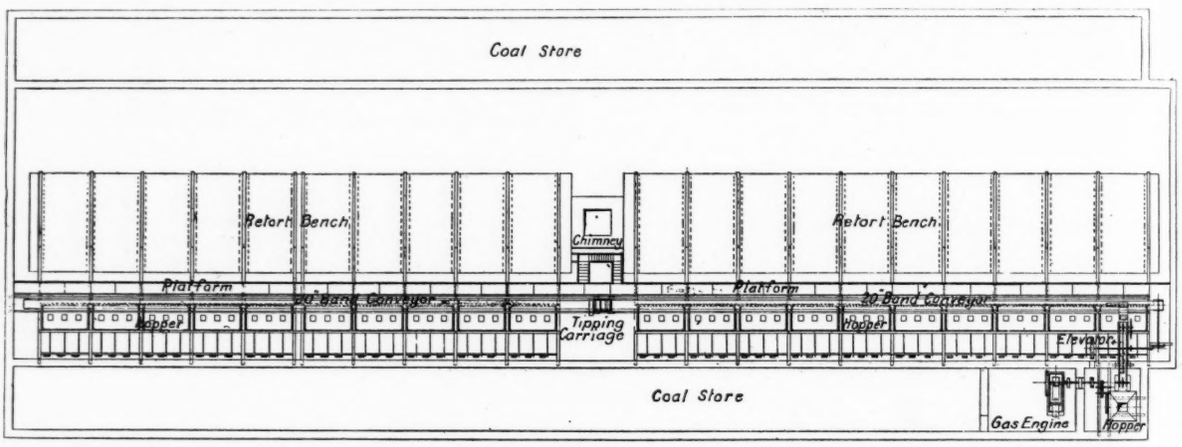


FRONT ELEVATION.

gravity-bucket conveyor is continuous, and takes the coke vertically from the filler through the retort-house roof, and delivers it into a receiving-hopper fixed in the centre of the yard—the return buckets passing down and through the subway to the filler again. The arrangement will be better appreciated from the photographs. From the receiving-hopper the coke is delivered on to a radial plate conveyor, which in turn delivers into three series of hoppers, or stores the coke in the yard as required—suitable throw-off arrangements being provided for this purpose. The whole of the plant (which has many features of engineering interest) is supported on a steel structure as shown on the drawings and illustrations, and is complete with staircases and platforms, so that any portion of the plant or machinery can readily be attended to. The whole of the coke plant is driven by a Tangye 25-brake horse power gas-engine. The first series of coke storage hoppers is built alongside the railway, and will hold 50 tons of coke, and railway trucks are filled from these hoppers. The second series of hoppers will hold 25 tons of coke, and is for filling carts, which can be backed underneath. The third series of hoppers will hold 15 tons of coke, and is provided



END ELEVATION.



PLAN.

with weighing apparatus for filling barrows and bags; the shoots to the weighing-machines being fitted with screens for taking the breeze from the coke.

THE NEW WORKSHOPS.

A further great improvement has been the concentration of all the workshops, and some excellent provision for the workmen, in a new range of buildings. To Mr. Dunn, in consultation with Mr. Ford, the design, general arrangement, and equipment of these buildings are due. The completeness of the whole, and the suitability of the various departments for their special purposes, show the prevision characteristic of the designer, and gives assurance that there will be better and more economical work done, and greater supervision, than could possibly be attained in the scattered and isolated shops of old. One thing that has enabled this range of workshops to be constructed is that, some two years ago, the Corporation were able to take in a roadway which bisected the works, and which led to a manufacturing establishment now closed down. On part of the site of this old roadway, the range of workshops stand. But the bringing of the land thus secured into the service of the gas-works has not been without its difficulty, and has entailed a large amount of work in levelling down and so forth; but it has had compensating good consequences in that it has laid bare a fairly large section of the old pipe connections in the works, and their relaying brings knowledge of their condition quite up to date. Furthermore, the levelling down will give better access all through the works. However, the range of buildings occupies a ground space of 125 feet by 30 feet.

The ground floor is divided into a stove and meter repairing shop, fitting and machine shop, smiths' shop, meter-testing room, painters' shop, workmen's mess room, and laboratory and photometer rooms; and on the first floor are found a finished stove store, joinery and pattern shop, and workmen's bath room and lavatory. The whole of the various shops and rooms are admirably adapted for their purpose, and are lofty, light, and well ventilated. As Mr. Dunn puts it, when constructing a place for a particular purpose, one can better design and fit it for that purpose than when adapting an old place to a new use. There is still a little fitting up required and tools to be installed; but the work is far enough advanced for a few additional notes to be made. The stove and meter repairing shop strikes us as being the best one of the lot. It is excellently arranged; and there will be no excuse, with the conveniences provided, for not turning out good work, and that, from examples inspected, the Stockton men can do. Benches, tools, polishing-machines, space, shafting ready for any required machinery, and provision for every workman keeping his own equipment to himself, can be, or will soon be, seen here. The department are doing well now in the matter of stove repairing; and when, on a gas-works, from a dilapidated condition stoves can be brought into the quite new-looking condition of samples on view—well, there is no cause to be ashamed of showing repaired stoves even to a new customer. From this shop runs a Pickering's rope lift for carrying the renovated stoves to the large finished stove store above. It is noticed while on the ground floor that the floor above has been supported in such a way that it must be capable of carrying any weight that can be put upon it. The fitting-shop is another excellent room; and in it one is principally attracted by an old-fashioned engine, which looks powerful and is running as smoothly as one of more modern construction. It was formerly an old gas-engine; but it has been converted for steam. One of the men who has been on the works for 36 years states that this engine was there before his time. It must be an old Lenoir engine; and perhaps, if Mr. Corbet Woodall reads these lines and the remarks made by the Mayor during the inspection last Friday, he may be able to throw a little light on the history of this interesting old engine. Passing from the shop, the men's mess room, the smithy (with its two forges, and fan steam-blast), the painters' shop, and the meter-testing shop are all visited. In the last-named is found one of Messrs. W. & B. Cowan's 10-feet test holders. It is seen that means have been provided for testing meters of any size and at any pressure. In the chemical laboratory, completeness reigns; and in the adjoining room is found a photometer fitted as completely as photometer ever was. It is of Messrs. Alexander Wright and Co.'s make; and tests can be made with it by half-a-dozen or so different methods. There is the "Flicker" photo-

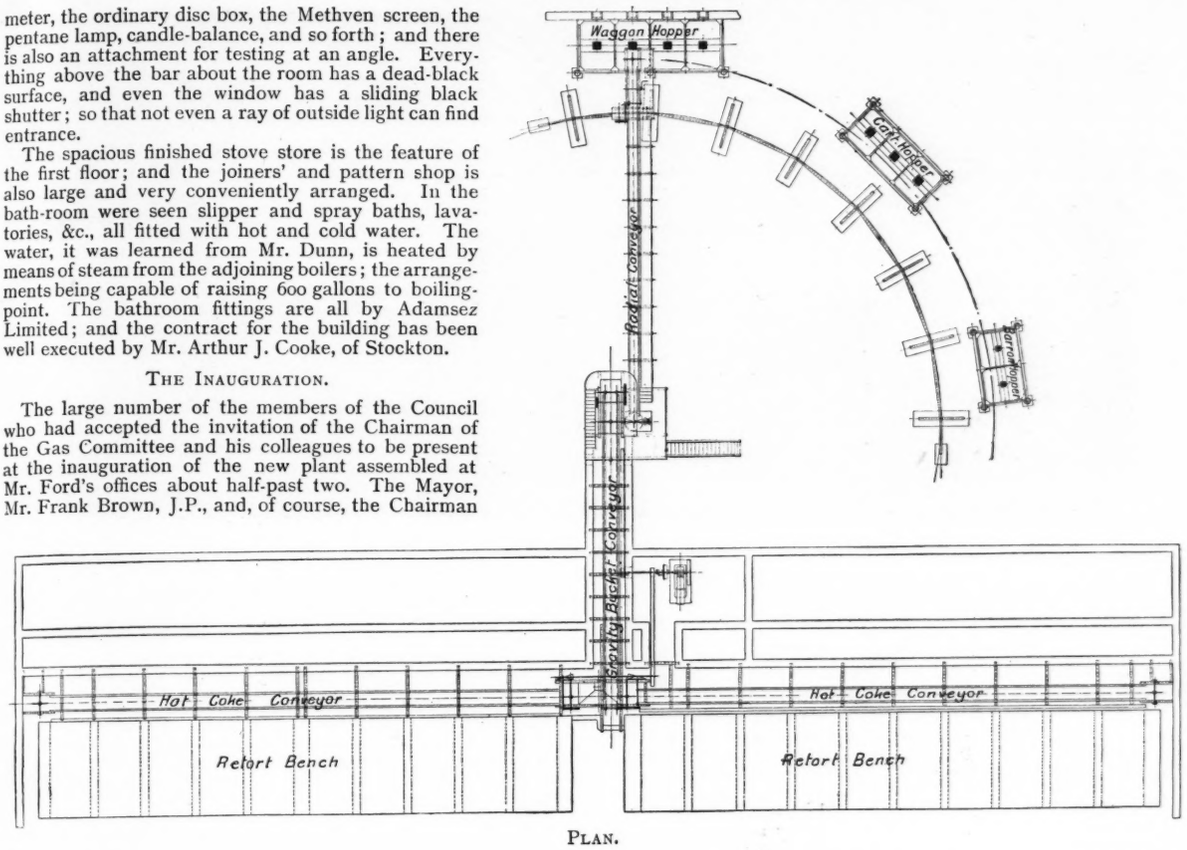
GENERAL ARRANGEMENT OF COKE-CONVEYING PLANT.

meter, the ordinary disc box, the Methven screen, the pentane lamp, candle-balance, and so forth; and there is also an attachment for testing at an angle. Everything above the bar about the room has a dead-black surface, and even the window has a sliding black shutter; so that not even a ray of outside light can find entrance.

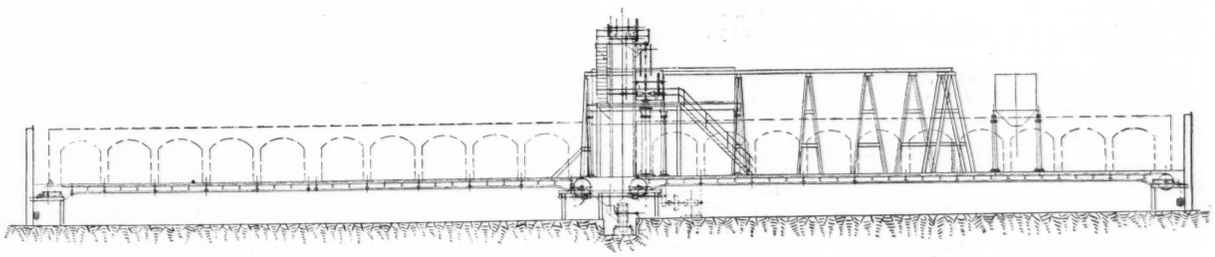
The spacious finished stove store is the feature of the first floor; and the joiners' and pattern shop is also large and very conveniently arranged. In the bath-room were seen slipper and spray baths, lavatories, &c., all fitted with hot and cold water. The water, it was learned from Mr. Dunn, is heated by means of steam from the adjoining boilers; the arrangements being capable of raising 600 gallons to boiling-point. The bathroom fittings are all by Adamsez Limited; and the contract for the building has been well executed by Mr. Arthur J. Cooke, of Stockton.

The Inauguration.

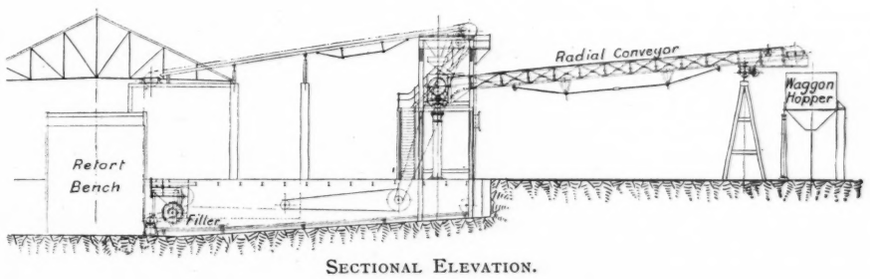
The large number of the members of the Council who had accepted the invitation of the Chairman of the Gas Committee and his colleagues to be present at the inauguration of the new plant assembled at Mr. Ford's offices about half-past two. The Mayor, Mr. Frank Brown, J.P., and, of course, the Chairman



PLAN.

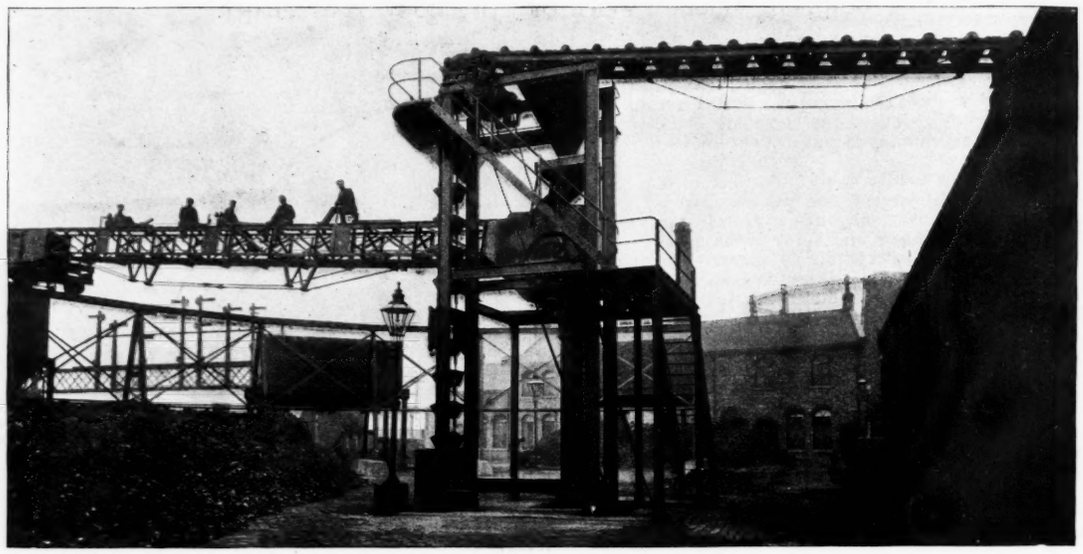


FRONT ELEVATION.



SECTIONAL ELEVATION.

of the Gas Committee, headed the party, and were accompanied by Mr. Ford and Mr. Dunn. They first proceeded to the retort-house, where it was found that the De Brouwer projector and the Jenkins-De Brouwer pusher had been gaily decorated with diminutive flags by the men, who had also, for the occasion, produced a gleam on the "name plates" and other polishable parts to the reflecting-point. We have said "for the occasion," but are assured the men evince constant interest in the cleanliness of the machines. Alderman Harrison took the place of the operator on the charging-machine; and, under the direction of Mr. Dunn, he caused the machine to traverse the house; the operating part to buzz round; and he raised and lowered the machine to the various horizontal lines of retorts. It was obvious that it would not take much more tuition to turn the Chairman into quite a respectable stoker, aided by such simple appliances. Then the ram was placed in position; and, by it, the Chairman discharged his first retort clean and accurately, amid the cheers of those assembled. Retorts were charged and retorts were discharged by the men in the numbers of seconds that have already been mentioned. The evenness of the burnt-off layers in the retorts (which the writer had seen charged in the ordinary course of working in the morning) was pointed out to the visitors, and much admired. The ease with which these charges were cleared by the ram was duly observed; and as the masses of hot coke, from something like 6 cwt. charges of coal, came sliding out the other ends of the retorts without hitch, and were carried away smoothly and silently by the Drake plate-conveyor, there were many members of the Corporation who marvelled how the men could have borne the heat and burden of the shifts when the retorts were cleared by hand rakes and the hot coke barrowed into the yards. Sufficient to speedily send some of the visitors into the yard was the heat during the discharging, even when the greater part of the work was being done mechanically. The coal plant was inspected; and the work from breaker to overhead hopper was explained. Great interest was awakened by the coke plant when the councillors saw the coke being carried away without manual labour. The more curious descended into the basement, saw the return lengths of the conveyors, the shoot into which the conveyors fed the coke, witnessed the depositing of the coke in the revolving drum, and the feeding of it into the vertical line of gravity buckets; afterwards going outside to see the buckets with their load travelling horizontally from the roof of the house, and finally the coke discharged either into stock, or along the radial-arm conveyor into one of the overhead loading hoppers. The splendid size of the coke was remarked. Everything from beginning to end worked with the smoothness of clockwork; and



THE GRAVITY-BUCKET AND THE RADIAL-ARM COKE-CONVEYORS.

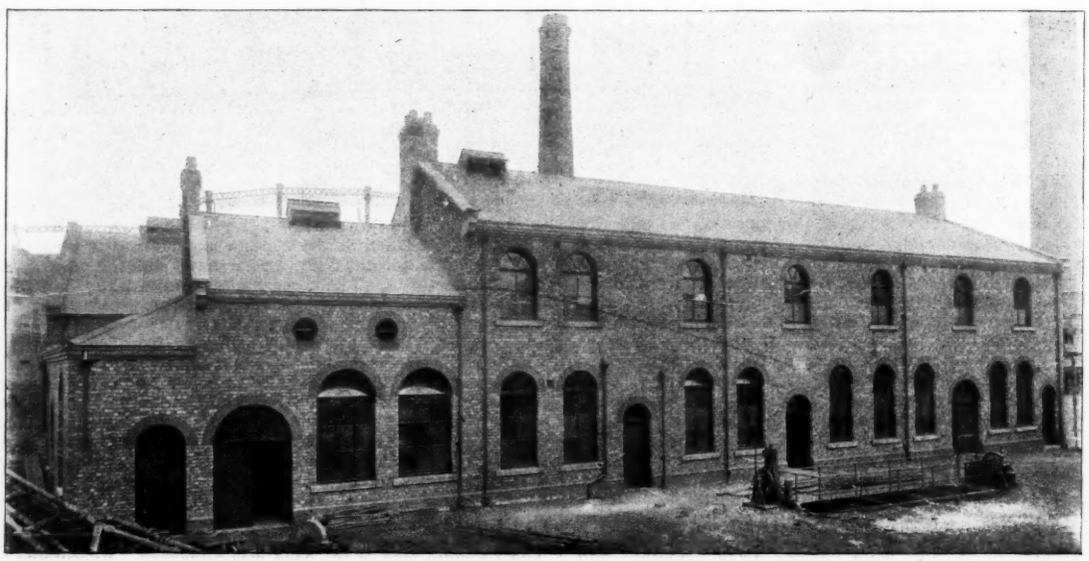
many were the compliments passed to Mr. J. A. Drake and Mr. W. J. Jenkins, as representing the contracting firms, and to the Engineer and Deputy Engineer.

The visitors having exhausted the many, even for laymen, interesting features of the new plant, the Mayor, the Chairman of the Gas Committee, with the Councillors, the Engineers, their staff, and the heads of the contracting firms, were grouped at one end of the retort-house and photographed, so that a pictorial memento of the interesting occasion (which may in the future be regarded as a historical one, if not even constituting an epoch in the annals of the undertaking) might be preserved.

This incident of the visit was followed by another, which was the crowning event of the day. The company assembled in the large finished stove-store for what was called on the programme the "opening ceremony." The Mayor (Mr. Frank Brown) was in the chair; and he was accompanied on the platform by Alderman Harrison and Mr. Ford.

His WORSHIP, in the course of his remarks, said it was really a happy coincidence that it should fall to his lot to be in the position that he occupied that day at the inauguration of the new mechanical plant, because he was born in the year that the Stockton Corporation, with the enterprise which they then and had since always evinced, acquired the gas-works, which were at that time erected at the corner of Bridge Road and Yarm Lane. At that time the revenue of the gas-works was not more than £7000 a year; and, if he remembered rightly, the accounts for the past year showed that the income was upwards of £75,000. At that time the population of Stockton did not exceed 12,000; now it stood at 55,000. Having regard to the large addition to the population, and the increased demands of the people, he thought that (whatever might be said of other departments of the Corporation) the Gas Committee had not been wanting in their duty to meet the needs of the people of Stockton and the immediate neighbourhood. Mr. Ford came to them as their Engineer and Manager in 1868, or early in 1869; but he (the Mayor) was concerned in the practical working of the gas-works long before Mr. Ford first came on the scene. (Laughter.) He remembered visiting the works as a boy—perhaps it was 1864 or 1865—when Mr. Corbet Woodall was the Engineer and Manager, and the late Mr. Wade was "the man who took the meters." He (the Mayor) came there with his father who at that time did the whole of the mechanical work of the gas-works, and who first put in the little engine they had just been inspecting. It was with great pleasure that he (the Mayor) remembered hearing Mr. Woodall and his father say the engine was a great success. It was because of this he was glad to be able to claim that he had had something to do with the initiation of the great departure they had inspected that day. The late Alderman Robert Craggs was the Chairman of the Gas-Works Committee when the property was acquired by the Corporation. Since then they had had, as Chairmen, Mr. John Hansel Wren, Alderman Joseph Richardson, Alderman Hind, and now their competent Chairman, Alderman John Harrison. He had much pleasure in asking Alderman Harrison to address them.

Alderman HARRISON said he could most heartily reciprocate the kind words that had been expressed by their worthy Mayor, and to say what a great pleasure it had been to be present to start the new machinery. He could assure the members of the Council that it had at times been a cause of much trouble—as to whether they were perfectly certain they were doing the right thing in asking the Corporation to sanction the spending of all this money, in order that they might improve the gas-works. However certain they might be themselves, when they were dealing with the ratepayers' money, it behoved them to be more than usually cautious before they undertook any new adventure. (In view of the technical character of the new works, the Chairman here read a brief and plain description, which was distributed among those present, in the form of a pamphlet.) Proceeding, he said, concerning the growth of the works, that in 1865 the output was 35 million cubic feet; in 1885, the sale was 207,257,000 cubic feet, an increase of 592·16 per cent.; and twenty years after (in 1904-5), it was 365,489,000 cubic feet—an increase of 1044·25 per cent., and nearly double what it was



THE NEW WORKSHOPS.

only twenty years before. The present capacity of the works was equal to 500 million cubic feet, so that they had plenty of margin for a number of years to come. In conclusion, he said he hoped, and he had every confidence, the works they had inaugurated that day would prove greatly to the advantage of the town.

The MAYOR expressed, on behalf of those present, their thanks to Alderman Harrison for his lucid statement. He also congratulated Mr. Ford and his deputy (Mr. Dunn) on the completion of the work they had had in hand for some time, and upon the success of its practical operation that afternoon. He then called upon Mr. Ford to perform a pleasing duty.

A PRESENTATION.

Mr. FORD said the task the Mayor had allotted to him was one of a very pleasing nature. The gas-works had now departed, he hoped for the better, from the old system of gas-works manipulation—especially in the retort-house, where heat and dust used to prevail to a large extent. Now the men were shielded in more ways than one from the arduous conditions of their work. He was glad that this revolution in the gas department had been brought about during the later years of his managership, but he could not have carried out the work without the persevering and energetic assistance of his deputy, Mr. Dunn. He could truly say that Mr. Dunn had never been idle one moment night or day since the installation they had witnessed was begun. He (Mr. Ford) was about completing 45 years' service in the gas industry; and one of the most pleasing duties he had had to perform was that which had now fallen to his lot. It was, in the name of the gas-works' officials, to ask Alderman Harrison to accept a little token of their esteem and regard as Chairman of the Gas-Works Committee. His hope was that the Chairman might long be spared to look upon this as a memento of the goodwill which the officials of the gas-works' staff bore him.

The gift consisted of a silver epergne of exquisite design, with two pretty side flower vases. At the base of the centre support were engraved the borough arms and this inscription:

> Presented to Alderman JOHN HARRISON, J.P., Chairman of the Gas Committee, on the occasion of the starting of the coal and coke handling plant and stoking machinery, and the opening of new workshops.
>
> STOCKTON-ON-TEES, *May* 25, 1905.

Alderman HARRISON, in acknowledging the gift, said he hardly knew how to thank his old friend, Mr. Ford, and the rest of the staff, for this very striking mark of their confidence and esteem. He could assure them all that he regarded this very highly indeed. As all who were engaged in public life knew, they as a rule got more "kicks than halfpence." On this occasion, everything was of the very opposite. He had certainly been spoken of more highly than he deserved. Since he had had the honour to preside over the Gas Committee, he had done his utmost to bear in mind the interests of the town. As Chairman of the Committee, many a time it had been extremely difficult to consider what was the exact and proper line of conduct to pursue. Sometimes, on the one side, they had the question of the officials and the men at the works; but what might be their interests might not, on the other side, be the interests of the others concerned. There were the interests of the consumers to consider; and those of the general body of ratepayers, who had to find the money wherewith to carry on the gas-works. The position had sometimes been extremely difficult; but it was very pleasing for him to know, at any rate, that he had earned the esteem of the officials and others connected with the works, although it was well known he did not always stick up for them. However, he felt highly gratified with the goodwill shown to him. This very pretty gift would be much valued by him; and he trusted that, when he rested from his labours here, it would be valued by those who came after him.

The Chairman's speech was heartily cheered, and with equal cordiality was the proposition of Alderman Rudd received, that the Mayor be thanked for his services in the chair. His Worship made a brief reply.

Tea and other light refreshments were subsequently served; and then—all apparently delighted with the afternoon's experiences—the company separated.

LABOUR STATISTICS.

The tenth abstract of labour statistics, which has just been issued by the Labour Department of the Board of Trade, does not lend support, when the whole of the figures bearing upon the question are taken into account, to the miserable decline in the demand for labour that some declamatory persons have urged the country to believe. Comparative percentage figures in this matter are really misleading; and they must be considered in relation to the total number of people employed at the beginning and end of a stated period, to show what is the actual condition of the labour market—whether, notwithstanding the inroads of labour-saving machinery, actual occupation has been found for a greater number of persons.

In one of the very first tables in the statistics, it is found that the percentage proportion of unemployed members of all Trade Unions making returns in 1888 was 4·9, as compared with 6·5 in 1904. That is an increase in the percentage of unemployed. But if we turn to another set of figures, and take only the number of people engaged at mines in the United Kingdom under the Coal Mines Regulation Act, it is found that, whereas in 1888 there were 549,184 so employed, in 1904 there were 847,553. These figures include persons engaged in and about coal, fire-clay, stratified ironstone, and shale mines. Again, in the period from 1896 (the first year the figures are available) to 1903, the number of persons employed in and about coal mines only increased from 678,690 to 828,968. Then as to the days worked per week in coal mines, the mean for 1895 was 4·74; and in 1904, it was 5·07. The corresponding figures for iron mines show little fluctuation; the mean of the days worked per week in 1896 being 5·72, compared with 5·77 in 1904. But it was an improvement. In the pig-iron industry, the average output per furnace in blast in 1887 was 18,665 tons, and in 1903, 25,584 tons, though there was a decrease from 405 to 349 in the number of furnaces in blast. Employment at iron and steel works was represented by a mean of 70,481 in 1898, and by 71,391 in 1904. But looking in another direction, labour in connection with the London Docks and Wharves has declined to a sad extent since 1901, when the daily mean number was 16,454—last year it was 12,988. Voluminous statistics regarding the production of coal, iron ore, and pig iron also show substantial increases between 1887 and last year; but while steel ingots advanced from over 3 million tons to upwards of 5 millions, puddled iron bars have decreased from 1,701,312 to 950,393 tons. These figures indicate that while the percentage of men out of employment last year was greater, the volume of work has been during the periods named largely on the increase; and the gas industry, through its gigantic strides, has given like advantage to labour.

The profit-sharing tables have peculiar interest. Since 1829, 193 schemes have been started; but 116 have ceased to exist. As to 13, particulars could not be obtained; and there were only 64 known to be in operation at June 30 last year. On that date 47,526 persons enjoyed participation in profits under schemes, as against 45,179 at June 30, 1903. Gas and tar distilling works took second place, with a total of 8217, in the number of persons so participating; the premier position being taken by the engineering and shipbuilding trade, with 23,262. It is a remarkable thing that, with the marvellous success recorded by the gas companies who have adopted the system, it has not, by the sheer force of brilliant example, made greater progress. We find an analysis of the causes which have produced the cessation of the 116 profit-sharing schemes; and they are interesting. Two were due to the death of the employer; two to the jobs having been finished; three to the enterprise being abandoned; eighteen to liquidation or dissolution; thirteen to changes in, or transfers of, businesses; twenty to losses or to want of success; two to diminution of profits; eight to apathy of employees; one to dissatisfaction of employees and grant of increased wages; three to disputes with employees; thirty to employers' dissatisfaction with results; two to grant of shorter hours; one to substitution of fixed rate of interest; five to special circumstances; and in the case of six, the cause is unknown. Taking 56 cases of profit-sharing schemes existing in 1902, the mean bonus was 4·7 per cent. on wages; and in 1903 5·1 per cent. on wages.

It is a matter of considerable satisfaction to notice that trade disputes show a material decline, evidencing that for some years now the trend has been towards greater composure in the relations between capital and labour. The number of disputes in 1893 was 615; and in 1904, only 334. The number of workpeople directly and individually affected by disputes in 1893 was 634,301; and in 1904, 83,922. The aggregate duration of disputes in working days was in 1893, 30,467,765; and in 1904, 1,416,265. Questions affecting wages and hours of labour were, of course, responsible in those and the intervening years for the greatest trouble. The application of conciliation and arbitration to the settlement of trade disputes continues to work with splendid effect.

Regarding accidents, it is found that in 1903, gas-works have to their account a death roll of 27, as compared with 40 in 1902; and 1208 injured as against 1004 in 1902.

Turning to the statistics more immediately associated with trade unionism, it is seen that the year of largest membership of the National Union of Gas Workers and General Labourers was 1899, when the total was 48,030. In 1903, it was 31,783; so that there has been a substantial falling off in the adherence to this Union. The income in 1899 was £20,533; and in 1903 it was £19,601. The expenditure in 1899 was £22,393; and in 1903, £20,587. The finances will not long stand this excess of expenditure over income—seeing that in 1899, the available balance of funds amounted to £7015; in 1900 to £8449; in 1901, to £8759; in 1902, to £6354; and in 1903, to £5368.

It is unfortunate, for accuracy of information, that in the statistics as to the number of persons employed in various occupations, gas should be classed with water and sanitary service. But so grouped, we find that in 1881, the number was 29,679; in 1891, 47,285; and in 1901, 78,686. Of this last number, 125 were females.

In a lamp for burning petrol which is being placed upon the market at the present time, the oil reservoir is constituted by a perforated block of absorbent material, so that there is no free liquid. The lamp is so arranged that the chimney-draught sucks atmospheric air through the perforations of this block, and thus supplies the burner with a carburetted mixture which meeting a further supply of air on its way up the burner-tube, reaches the burner in proper dilution to give a hot bunsen flame with perfect combustion. The cost of consumption is claimed to be less than one-quarter as compared light for light with paraffin at 8d. a gallon.

THE GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 601.)

DULNESS was still the characteristic of the Stock Exchange last week, an incubus which it seems quite unable to shake off. All the factors tended rather to help it to stay. The condition of the American Market and the intolerable protraction of uncertainty in the Far East were still active; and to them at the close was superadded apprehension lest Russia should play violation of Chinese neutrality as her next card. So a dull week was at about its dullest at the finish. In the Money Market, there was some fluctuations; the influences up and down working alternately, but not to any marked extent in regard to short loans. Discount, too, was uneven, but closed fairly easy. In the Gas Market, business was quite active; all the big issues being more than usually animated. The tendency, on the whole, was favourable, though one or two issues which had been run up rather too sharply had to come down a little, and some important stocks were rather higher. In Gaslight and Coke issues, the ordinary was very brisk and strong, and the price steadily rose until it topped par. The worst price of the week—99—was the first bargain marked; and the best figure—100⅛—was done on Thursday and Friday. The secured issues were only moderately dealt in. The maximum changed hands at 92 and 92¾, the preference at 109½ and 110½, and the debenture at from 90¾ to 92. South Metropolitan was very firm at from 128 to 129, at which last price several transactions were recorded; but nevertheless the quotation was left standing unchanged. The debenture realized from 90¼ to 91. Very little was marked in Commercials; but the restoration of the old prices continued. The 4 per cent. was done at 114½ and 115, and the 3½ per cent. at 112 and 113. One transaction in the debenture was at 87½. Not much was done in the Suburban and Provincial group, though at the Mart several large parcels were quickly sold. Bournemouth "B" was done at 17, Brentford new at 188, and British at 40⅝ and 40⅜. South Suburban was done at 122¼, Tottenham "B" at 101, and West Ham at 102½, ditto preference at from 124½ to 125, and ditto debenture at 105. On the local Exchanges, all three issues of Sheffield had a rise of a point; but Newcastle was set back to a similar extent. Among the Continental Companies, there was more doing in Imperial than has been the average of late; but the price was a little weaker, and the quotation had to come down a point. Actual transactions showed figures ranging from 214½ down to 212¼. Union was done 113 and 114¼, and European fully-paid once at 22½. Among the undertakings in the remoter world, Bombay fully-paid marked 6 11/16 and 6¾, and Oriental changed hands at from 147 to 147¾. Cape Town receded slightly, and marked 17½ and 17¾. Melbourne 5 per cents. were done at 102¾, and ditto 4½ per cents. at from 101¾ to 103. Monte Video marked 12⅛, San Paulo 12½, and River Plate was lower with business marked at from 11¾ to 11⅞. Primitiva ordinary marked 5⅞, ditto preference 5⅛, and ditto debenture 97¼ and 97½.

The closing prices are shown in our Stock and Share List on page 601.

ELECTRIC LIGHTING MEMORANDA.

The London Electricity Bills—An Electrolysis Clause Granted—The Land of the Gas Companies—Municipal Wiring and Fittings in London to be Self-Supporting.

IT will take some little time for the numerous electricity supply interests of London to thoroughly master their position in the new state of things that has been created by the passing by the Lords Committee of the Administrative County of London and the Metropolitan Electricity Supply Companies' Power Bills, together with the other measures or parts of measures which they have allowed to proceed. What the position is will have to be completely investigated by them, in order to strengthen their case, before the Bills reach the Commons Committee, who will have a somewhat "softer job" than the Lords had when they entered upon the consideration of their group of nine Bills some two months since. Of course, the Committee of the Lower House may further relieve the embarrassment of the existing suppliers who are far from being pleased at the idea of having to face the competition of the huge Power Companies. From the point of view of the ratepayers in those areas in which the Borough Councils have invested heavily in electricity, and in some of which the financial position of the undertakings, even under monopoly conditions, is not a rosy one, the prospect is anything but cheerful. If they cannot make a profitable thing of the business now, what possible chance will there be for them when, if the Bills succeed to the end, there is a very active competitor against them in that very branch of the business where there was before a fair outlook for them. In the other branch—that of lighting—gas is surely winning back ground that it has lost, and the front it is opposing to-day to the advance of electricity is found to be of such a precipitous character that the purveyors of the latter have discovered that to climb it is a matter of extraordinary difficulty. So that, while it must be hoped by the Metropolitan Gas Companies for several reasons—as ratepayers, as the owners of valuable underground property, and as competitors—that the Power Bills will be thrown out in the next House, it must be obvious to all that, if they are not, the prospect is not a pleasant one for those at present engaged in electrical supply in London.

There are matters of interest which we may briefly extract from the mass of discussion which has been proceeding on the clauses of the two Bills during the week. The Administrative County Company are to be confined to the industrial area north of the Thames and to the non-industrial western area on the south side; so that they have had their wings clipped considerably. On the other hand, exploitation by the Metropolitan Company is to be confined to the non-industrial area north of the river. The Committee have evinced a desire to lighten as much as possible the hardship that must come upon the existing distributors in the areas affected; and, by new clauses, there is to be a very broad reference to the Board of Trade in connection with this matter. They confer upon the Board the power to impose such terms and conditions as may be necessary for the protection of distributors within an area of supply; and, in imposing these terms and conditions, the Board are (where this applies) to have regard to the fact that the undertaking of the existing distributors is purchasable by the local authorities. The question of the withholding of consent is also to be dealt with by them; and, furthermore, if the requirements put upon the new Company are not complied with, the Board may order that their power within an area shall cease. As to what the existing Companies think of this, we shall know more when the Bills are in the Commons, as they have, instead of taking part in the discussion of clauses at this stage, reserved themselves for a renewal of the struggle there. An important point regarding the price did not slip the lynx-eyed Chairman. Throughout their evidence, the Administrative Company have been talking of supplying at ¾d. and less per unit; but the standard price they proposed in relation to the sliding-scale was 1d., and the dividend 8 per cent. If they could supply at the outset at ¾d., it follows that they would be doing a profitable business at 1d.; and the dividend would be a remarkably fine one right from the start. A suggestion from the Chairman has brought the standard price down to ¾d. There was great resistance on the part of the Company to a proposal by the Metropolitan Water Board that a clause should be inserted for the protection of the pipes of the Board against any possible damage by electrolysis; but the Committee very fairly determined to make the Company liable for damages caused in this manner. The Kingston Gas Company secured a similar clause, as did also the Brentford Gas Company in the Metropolitan Electric Supply Company's Bill. In the latter Bill, too, the Brentford Gas Company were instrumental in getting a clause making the promoters liable for nuisance caused by the escape of electricity.

The Gas Companies, however, have not scored all gains in their contest with the promoters of the Administrative County Bill. The singular and impudent request of the latter for power to wrest certain lands or privileges from the Gaslight and Coke and South Metropolitan Gas Companies, with whom they will be in competition if the Bill succeeds in the next House, has been largely successful; and we take it the Gas Companies will now have no opportunity for appeal, seeing that the course of procedure adopted by Lord Camperdown's Committee left the final discussion of the questions at issue until clauses were under consideration. In the case of the Gaslight and Coke Company's land, there can be less surprise over the result than in the case of that of the South Metropolitan Company, seeing that the land at Fulham which was scheduled in the Bill was some time since offered for sale by the Company. But there are restrictions on the use of the land for gas-manufacturing purposes; and the Gas Company contend—and rightly—that if Parliament are willing to grant powers of manufacture on the land to an electricity company then, *a fortiori*, why should not the Gas Company in whose possession the land is at present have the right of manufacture thereon? In this event, the land would be of considerably more value to them. But it remains part of the schedule of the Bill. Regarding, however, the South Metropolitan land at East Greenwich, the position is certainly a peculiar one. The promoters finally asked for running powers over a railway siding of the Gas Company which is not even yet constructed; and, as matters now stand, the Gas Company are to be compelled to do one of two things for the benefit of the Electricity Company—either construct the branch railway within six months, or sell the latter the necessary land for the construction of a siding of their own. Readers can apply all sorts of comments to the audacity of the promoters and to the injustice placed upon the Gas Company; and whatever their nature, they can hardly be more than are merited. Surely the Gas Company should be allowed to peacefully enjoy their statutory possessions without the interference of an Electricity Company, and to construct their own siding at such time as may be to them most convenient.

How municipalities the country through who are working their electricity undertakings on questionable business principles must detest the author of the original Bermondsey clause. The clause in its primitive form was not by any means perfect, as even those who took part in its drafting would be quite willing to admit; but we have gone from better to better in its improvement, until in its various acceptable forms the original is hardly to be recognized. But the Committee of the House of Commons who have been

considering the General Powers Bill of the London County Council have made the principle of the clause in its application to the wiring and fittings business still more stringent, as will be shown. We have had much to say from time to time on the subject of the wiring and fittings clauses in this Bill, by which the County Council, in its maternal interest for the London Borough Councils running electricity businesses, are proposing to obtain for them indulgence in the matter of wiring premises and supplying fittings, motors, and other apparatus. The London Gas Companies and the Wandsworth and Putney and Brentford Companies object to this form of rate-aided competition, and so do the Association of Electrical Contractors; and they carried their grievance before the Commons Committee who considered the Bill. The contractors, however, were not so keen about getting the clauses removed as about ensuring that, if they were retained, it should be specified that the work should only be done through contractors. The contractors in this matter really spoiled themselves by their double-faced attitude. They opposed the principle of municipal trading on the one side; and on the other they did not object to the municipalities—good customers that they would be, and certain payers—finding the money, and letting the contractors do the work. And so for the second time this session in coming to close quarters with the London County Council over this matter, they find themselves defeated. The clauses stand; but for the Borough Councils at what a price! The Gas Companies would naturally rather see such clauses altogether rejected by Parliament; but they will never raise any violent objection to them as ratepayers if the precedent which the decision of this Committee gives us is followed in future. It appears that, to enervate the opposition, a proviso had been introduced—something on the lines of the Bermondsey clause—that "so far as reasonably practicable" the Councils should so adjust the charges to be made by them as to meet any expenditure on the fittings; and a further provision expressly restrained the Councils from manufacturing fittings, or apparatus. The words "so far as reasonably practicable" did not, however, give to the clause the definite character the Committee desired; and so they struck them out, which makes it dead-certain that no loss will fall on the rates from this extension of municipal trading in the Metropolis. They also insisted that there should be a provision for interest and sinking fund charges. We frequently find ourselves in agreement with our friends of the "Electrician" in the matter of policy; and, in this instance, they do not think the clause goes far enough, in view of the fact that the question of depreciation has not been taken into account. The decision, however, is one that will be freely referred to and applied in the future, if the clauses and provisions are not put out of existence by their withdrawal. The County Council were refused the clauses a previous session; and if they want them now for the Borough Councils they must take them on the terms laid down by Parliament. It is worth remarking that the trend of the evidence in favour of conferring these wiring and fittings clauses was that people frequently require a little gentle persuasion before they will adopt the electric light; and this is one of the means of persuading them. The idea is an admirable one, providing that such costly persuasion is borne entirely by the individuals who need it.

CHEAP ELECTRICITY FOR MOTIVE POWER.

WITHIN the past few days an envelope was delivered at the "JOURNAL" office bearing on the face the words "Important Notice as to Price of Electricity." The subject being one which has a particular charm for us, curiosity uncovered a circular, bearing on the front page the words "Cheap Electricity," and on the third page "How to Obtain Cheap Electricity—A Practical Suggestion." Up to this point, we may be excused if we imagined that one of the Electricity Supply Companies in the City was making an attack on the "JOURNAL" for its custom. At the top of the next page, the heading was found "Electricity at 2d. per Unit;" and as we read on the source from which the circular had emanated became apparent. The argument is that——

There are many business men and others who, having spent very large sums of money on the installation of electric fittings, do not wish to write those sums off as wasted, and would therefore prefer to continue using electricity if they could only get it at a low cost per unit. This they can do—owing to the elimination of distribution, establishment, collection, bad debt, office, and other expenses—by generating electricity on the premises by means of dynamos driven by gas-engines. By this means (which has already been adopted with every success and satisfaction by many consumers of electricity in London and elsewhere) current can be generated for from 1½d. to 2½d. per unit, according (1) to the size of the plant, and (2) to the proportion borne by the actual to the possible annual output of current—in other words, to the load-factor—the costs quoted including all charges: *i.e.*, interest on capital, depreciation, wear and tear, labour, water, oil, and sundries, in addition to the cost of gas consumed. [Here follows a list of some of the principal installations of gas-driven generating plants in the Gaslight and Coke Company's district, ranging from the Agricultural Hall, with its 725-horse power, down to an installation of 54-horse power.] There are also a very considerable number of smaller installations, ranging from 5-horse power upwards. It may be mentioned that the size of plant required may be calculated by dividing the number of 16-candle power lamps (or their equivalent in consumption) by 10. The result is the horse-power required.

Then the circular goes on to point out that the Gaslight and Coke Company are prepared to supply and instal gas-engines for generating electricity in their district, and, in approved cases, to accept payment for such engines by instalments spread over a period of years. The Company have also made arrangements with dynamo makers, whereby the same system of payment can be applied to the dynamos required.

By this means, the plant is paid for out of the saving effected in the cost of current, and then becomes a source of great economy to the owner. For instance, a consumer using the equivalent of 500 16-candle power lamps, and paying £400 per annum for (say) 24,000 units, would require a plant costing him altogether not more than £600, by means of which he could generate the same amount of current per annum for £200, including all costs. He would, therefore, pay for his plant out of his savings in three years, and then be £200 a year in pocket for all time. (If the annual consumption for the same number of lights were greater, the saving would be increased, and the plant paid for in a shorter time.)

It is also announced that the Gaslight and Coke Company allow discount on gas used for engine purposes at the following rates (gas at 2s. 11d. per 1000 cubic feet): If the account does not exceed £500 per annum, 5 per cent.; from £500 to £1000 per annum, 10 per cent.; from £1000 to £1500 per annum, 15 per cent.; exceeding £1500 per annum, 20 per cent.

There are other points about the circular which cannot be usefully noticed here; but the feature that strikes us most about this new essay of the commercial department of the Company in instructing the people in their district is the skill with which the circular has been prepared so as to obscure the fact that it has had its origin in the gas office until the reader is quite interested in this scheme for giving him cheap electricity. The "Electrical Times" the other week, in referring to a recent lecture by Mr. John Holliday, remarks that the lecturer wound up by saying that if consumers "must have electric light, they should get a gas-engine to drive the dynamo. Mr. Holliday," adds our contemporary, "is about twenty-four years behind his time; that was not bad advice in the early eighties before the days of public supply." The electric light companies would be glad if Mr. Holliday was about twenty-four years before his time; for the idea of coupling up a gas-engine with a dynamo is an idea that is finding favour with the commercial public. At all events, that is the experience in London.

PERSONAL.

The Richmond (Yorks) Corporation have called in Mr. MATT DUNN to report on their Gas-Works, with a view to their extension and general improvement.

Dr. WILLIAM ARTHUR BONE, lecturer on chemistry, Manchester, was recently elected a Fellow of the Royal Society. Mr. Bone's name has on several occasions been mentioned in our columns in connection with his investigations on the combustion of ethane and methane.

The many friends of Mr. R. SEYMOUR BENSON will probably learn with surprise that he has decided to resign, as from the 30th prox., the position of Managing-Director of Messrs. Ashmore, Benson, Pease, and Co., Limited, which he has held since the formation of the Company in 1885.

At the meeting of the Lincoln City Council last Tuesday, Mr. N. M. BARRON, of Margate, was selected, out of 108 applicants, for the position of Water Engineer. The successful candidate, who is only 30 years of age, was articled in 1892 to Mr. W. Boulton, late Borough Surveyor of Aberdeen, and was subsequently appointed Assistant Water Engineer for Aberdeenshire. In 1899, he obtained the post of Assistant Water Engineer to the Corporation of Warrington, remaining there until the year 1903, when he went to Margate to take up his duties as Resident Engineer. A year later he was promoted and placed in charge of the whole of the works there.

The members of the Rochdale Town Council recently had a pleasant gathering for the purpose of recognizing in a suitable manner the long services rendered to the town by Mr. W. J. PETRIE, J.P. It took the form of the presentation to him of the honorary freedom of the borough, and also his portrait in oils. The latter the recipient has generously given to the town; and it will be hung in the Mayor's Parlour with other portraits of distinguished citizens. The casket containing the scroll was presented by the Mayor (Lieut.-Col. Fishwick, J.P.), who said it was the most pleasing duty he had performed during his mayoralty. He expressed the hope that Mr. Petrie would be spared for many years. The portrait was presented by Alderman Hardman, who said it was given as an expression of the appreciation by the members of the Council and others of Mr. Petrie's work. The presentations, which were suitably acknowledged, call for notice in our columns from the fact that Mr. Petrie has been for twenty-seven years the Chairman of the Gas Committee of the Corporation; and it was stated in the course of the proceedings that in this period a sum of £271,000 had been handed over by the Committee in relief of the rates—an average of more than £10,000 a year—while during the last twenty years no charge had been made for the public lamps.

GAS-ENGINES AND PRODUCER GAS PLANTS.*

Any work upon these subjects which bears the hall-mark of Mr. Dugald Clerk's approval is sure to receive careful attention; but there can be little doubt about the welcome that will be accorded to Mr. Mathot's book for its own sake. In his preface to it, Mr. Clerk bears testimony to Mr. Mathot's fitness for the task he has undertaken, and is of opinion that he has dealt "effectively and fully with all the principal detail points in the installation, operation, and testing of these [gas and oil] engines. I know," he goes on to say, "of no work which has gone so fully into the details of gas-engine installation and up-keep." With this, it is impossible not to agree.

So far, indeed, as can be recollected, no attempt has ever before been made to cover so wide a range in connection with gas-engines as this volume of 314 pages, including index. It comprises 14 chapters, which deal not only with the construction of the gas-engine, but also with all the details of its installation, and the conditions essential to satisfactory working. Certain of the details may appear to be somewhat elementary; but the author caters for the needs of users of these engines more than for those who are engaged in their construction, and to these scarcely any details are likely to come amiss. It is, however, somewhat of a surprise to be told that "the pipes by which fuel is conducted to engines, driven by street-gas, and the gas-bags, &c., are rarely altogether free from leakage;" and, further on, that "it seldom happens that the leakage of a pipe 30 to 50 feet long, supplying a 30-horse power engine, is much less than 90 cubic feet per hour." We have a better opinion of the way in which gas-fitting is usually done than to believe that any such faulty work is possible under proper supervision. The construction of wet and dry gas-meters is carefully explained, and many particulars given with regard to them which may or may not prove of service. In this connection, the utility is explained of anti-pulsators, bags, and pressure regulators. No mention is made, however, of the absolute necessity for some device of this kind for the protection of the meter. Both the drums of wet meters, and the diaphragms of dry meters, have been frequently destroyed by the strain caused by the suction of a gas-engine, from which efficient protection has not been afforded by the provision of bags or anti-fluctuators. No less are the latter needed for the protection of consumers in the immediate neighbourhood of a gas-engine; and in many recent Acts power is taken to enforce their use.

The first chapter of the book deals with the cost of installation of gas-engines compared with steam-engines, and one is met at the commencement of it with the statement that "in places where illuminating gas can be obtained, and where less than 10 to 15 horse power is needed, street gas is ordinarily employed. The author's experience probably relates to gas of a higher price than it is usually sold at in this country, where gas-engines of a much higher power than 10 or 15 horse power are continuously driven with town gas. His remarks on the advantages of a gas over a steam engine installation will be read with interest. In the next chapter, he deals with the selection of an engine, the construction and mechanism of which is lucidly described. The various methods of ignition, the design of the frame, and the automatic starting, all claim attention; and mention is made of the growing employment of vertical engines where small power only is required.

The third chapter deals with the installation of an engine, and the fourth with the foundation and exhaust. Here will be found some useful advice with regard to air vibration and exhaust noises. Water circulation is treated of in the next chapter, together with the prevention of incrustation and water coolers. Lubrication has a chapter to itself, which will be found not the least useful part of the book. The conditions of perfect operation are there dealt with, and a separate chapter is devoted to the starting of an engine and the preliminary precautions to be adopted. Perturbations in the operation of engines and their remedy are next dealt with; faulty compression and its remedy, and imperfect and also premature ignition being among the matters which are treated of. The tenth chapter deals with producer-gas engines, by which is understood engines—mostly of a high power—driven by blast-furnace, coke-oven, Mond, or other gas of a similar class—a prominent feature of which is the employment of a very high degree of compression, ranging to 170 lbs. per square inch and more.

The next chapter is entitled "Producer Gas," in which are given some analyses of town and producer gas, showing the difference in their composition. The chapter is, however, chiefly taken up with a description of the remedial measures to be adopted in cases of carbonic oxide poisoning. Next, there is a description of the various types of pressure producers, in which the Dowson producer, so well known in this country, figures prominently. Following this, suction-gas producers have a chapter to themselves; the design and construction of the principal forms being fully described and illustrated, while the conditions necessary for their perfect operation are noted. No reference is, however, made to the successful use of gas coke in this type of producer.

A chapter on oil and volatile hydrocarbon engines, and another on the selection of an engine, close the book. The latter, although bearing the same title as the second chapter, treats of such different matter that another title for it could surely have been selected. Here the would-be user of a gas-engine is—very properly, some will think—recommended to employ a consulting engineer. Our author does not agree with every man being his own engineer, although doing his best to make him so. The rest of the chapter contains much useful information upon such subjects as testing the plant, explosion recorders, and analyses of gases; and it winds up with particulars of some tests of engines worked with pressure and suction producer and town gas.

The book is well printed and contains numerous illustrations. It is, moreover, thoroughly readable, and should, for the information it contains, find a place in the library of all users of gas-engines. It is perhaps somewhat confusing for the purposes of comparison with English practice to find calculations of calorific value stated at per cubic metre; but this slight defect may easily be remedied whenever another edition is called for.

* "Gas Engines and Producer Gas Plants." By R. E. Mathot. Translated by W. B. Kaempffert. Preface by Dugald Clerk. London: Crosby Lockwood and Son; 1905.

HOLLAND'S PATENT ROLLERS FOR CONVEYORS.

The unquestionable advantages attending the mechanical conveyance of hot coke from the retort-house have not unfrequently been counteracted by difficulties arising in connection with the working of the rollers, owing to the ingress of dust and gritty matters, which work into the bearings of the spindles, and soon wear them out. Trouble of this kind having come under the notice of Mr. W. T. Holland, the Secretary of the New Conveyor Company, Limited, of Smethwick, he gave the matter his attention, with the result that he has devised a roller by the use of which he believes the principal difficulties which gas managers have hitherto met with in the working of conveyors will be effectually overcome. His invention, for which he has obtained provisional protection, is applicable to the running rollers of all kinds of conveyors, whether they are working in a water-trough in which the water contains a quantity of grit or other foreign matter, or in places where the air is laden with the dust of coke, ashes, cement, or other substance; and Mr. Holland claims that by its adoption the bearings of the rollers are effectually protected from access of grit or dust to them, with a consequent prolongation of their working life.

In carrying out the invention, the roller spindle is mounted so as not to turn in the brackets which secure it to the under side of the conveyor trays; and the rollers are mounted so as to turn on the spindles. Each roller is situated and revolves between the face of the bracket and a collar fixed on the end of the spindle; both bracket and collar being provided with an annular projecting side rib or flange. These flanges take into corresponding annular recesses turned in the sides of the roller, and by engaging in them prevent dust from working into the bearing. In a modification of the invention, the collar on the end of the spindle is dispensed with, and the roller has fixed upon its outer side a cap which encloses the end of the spindle, and thus protects it. In this case the roller is kept in position on the spindle by means of a washer inside the cap, and held on the spindle by a split cotter passing through the spindle, or by other suitable means.

We understand that the invention has been submitted to several gas engineers, who speak highly of its practical utility. Of course, the cost of manufacture will be slightly increased; but it is thought that this will be more than compensated for by the greater durability imparted to the roller and bracket. It is the intention of the inventor to constitute the Company with which he is associated the sole makers of his improved roller.

Annual Meeting of the Italian Gas Society.—The annual meeting of gas engineers in Italy will take place in Genoa, on the 12th, 13th, and 14th prox., under the presidency of Mr. H. J. Henry, the Manager of the gas-works in the city. The only technical items on the programme relate to the working of West's stoking-machines, and to the installation of a gas-fan for increasing the pressure and supply in place of laying a new main. The Sampierdarena (Genoa) works of the Compagnie l'Union des Gaz will be visited, and the Company will act as hosts during a trip to Rapallo on the 14th. The meetings will be held at the offices of the Company in Genoa.

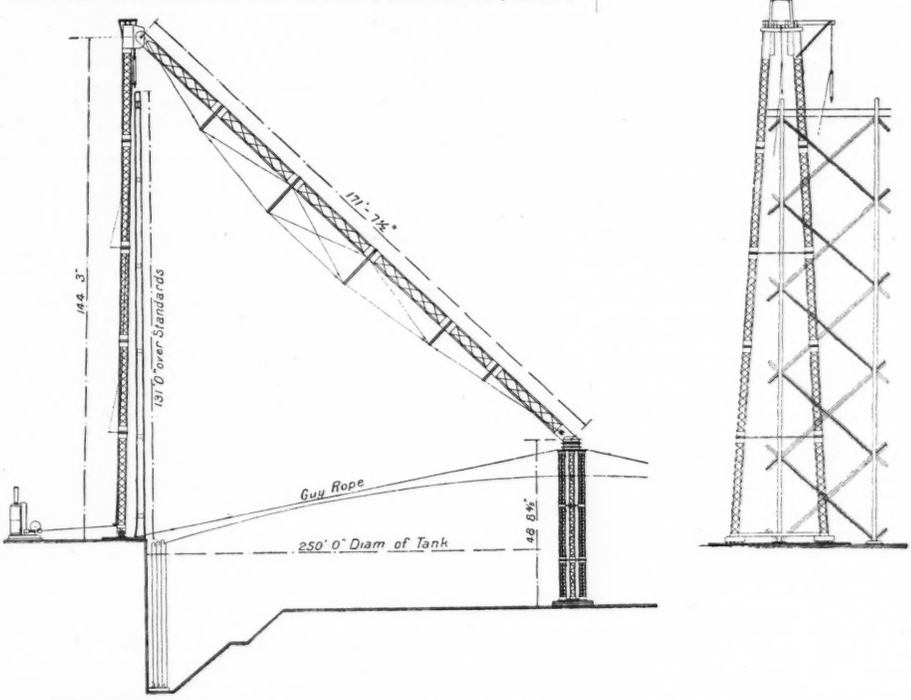
Proposed Consolidation of the Alkali Acts.—On Monday last week, Mr. Gerald Balfour presented in the House of Commons the Alkali, &c., Works Bill, the chief object of which is to consolidate the Acts on the subject passed in 1881 and 1892. It is practically the same Bill as that of last year; but advantage has been taken of the opportunity to introduce some amendments defining more clearly what is "noxious or offensive gas," and making the scope of the Acts dealing with such gas cover all the works from which it is given off. The measure, like that of 1904, has the words or passages which are new matter underlined, so as to indicate clearly how much is consolidation and how much amendment. The amendments deal mainly with definition. The Bill consists of three parts and two schedules—the second of the latter containing the titles of the Acts proposed to be repealed; and it is to come into force (if passed) on Jan. 1, 1906.

MANCHESTER AND YORKSHIRE JUNIOR GAS ASSOCIATIONS.

Visit to the Neepsend Gas-Works, Sheffield—Presentation to Mr. F. Oldfield.

The first combined Meeting of the above-named Associations took place last Saturday, when the Neepsend works of the Sheffield United Gas Company were visited. Upwards of 70 members were present. Special cars conveyed the visitors from the town offices to the works, where, in brief, happily-chosen sentences, Mr. J. W. Morrison, the Chief Engineer of the Company, bade them welcome, and introduced to them Mr. S. Cutler, jun. (of Messrs. S. Cutler and Sons, who are erecting the new holder which was the great object of interest in the visit), the Works Superintendent, Mr. John Power, and other members of the staff, who were acting as guides. Each visitor was handed a copy of the printed description, some particulars from which are appended, and in parties they then commenced the tour of the works.

Round the walls of the governor-house were arranged the drawings of the new holder and tank; and these were first explained. The new holder was then visited. Here Mr. Cutler had kindly temporarily suspended operations, and had arranged facilities for enabling the visitors to examine the holder crown and to descend into the tank. The holder itself is practically finished except some of the side sheets of the inner lift, and the joining up of the diagonally arranged crown sheets with the circumferential outer sheets. The guide-framing has only the lower portion of each standard in position; and much interest was displayed in the arrangements for its completion. The holder, which is 247 feet in diameter, is constructed in four lifts, each 43 feet deep, and will have a capacity of 8 million cubic feet. The guide-framing is of steel throughout, and consists of 28 standards 131 feet high, braced by 140 pairs of diagonals and terminated with a ring of solid webbed girders. Three lifts of the holder are guided; the fourth rising clear of the framing. The total height from the water-line in the tank to the top of the crown of the inflated holder will be 185 feet. Each lift has 56 vertical stays, and a corresponding number of bottom guide-rollers. There are in all 336 guide-carriages, each provided with a screw adjustment.



MESSRS. CUTLER'S METHOD OF ERECTING GUIDE-FRAMING FOR LARGE GASHOLDERS.

In a structure of this magnitude, the machine tool is nowadays a most important factor in securing accurate and sound work; and we understand that the whole of the top curb members and many other of the principal structural parts were entirely drilled by pneumatic machine drills at Messrs. Cutler's works. A considerable installation of pneumatic drilling and riveting plant has also been fitted up at the site, and will be used for all the important riveted joints of the holder and guide-framing.

The visitors on Saturday were much interested in the large shear-legs now being erected for lifting into position the members of the guide-framing. The general arrangement of these is shown in the two preceding illustrations, in which will be seen the radial "back leg," which is so distinguishing a feature of their design. The vertical legs are each 150 feet in height, and the back leg, which reaches the length of 172 feet, is carried upon a turntable fixed upon a steel tower some 50 feet in height. The design and erection of such tackle as this is necessarily a matter requiring great skill and judgment; but its advantages are obvious, as the shears can be moved round the tank with unusual facility, and without the risks and delays which inevitably attend the more usual "guyed" shear-legs.

In all directions there was evidence of the careful forethought and abundant resources which are so necessary in carrying out a contract of such importance; and it is a matter for congratulation to both the Company and the Contractors that the progress of the work is such that its completion well within the very limited time stipulated in the contract is practically assured.

At the time of the visit, the back leg of the shear-legs had been raised nearly to its full height; and after a temporary stoppage of work, it was finally brought into position before the hour for tea. As the members of the Yorkshire Association had listened so recently as October last to Mr. Doig Gibb's lecture on the construction and erection of his 6 million cubic feet holder at Newcastle, and followed him by the aid of his drawings and lantern illustrations, the present visit had been the more keenly anticipated as a practical illustration, and reminiscences of that lecture were freely exchanged down in the depths of the tank. Before leaving the holder, the machines for cutting the remaining crown sheets into shape, and the compressors for operating the pneumatic rivet drivers, were examined.

The several parties then crossed to the works proper. Being off the busy season, some beds of retorts were in course of demolition, and others of rebuilding; and full advantage was taken of the opportunity thus afforded of inspecting the work. Many of the members made their first acquaintance with built-up brick retorts, which alone are in use at these works, and closely noted the details. Mr. Morrison and his staff freely explained the practice at the works, and answered an eager flow of supplementary questions; one point emerging from which was the information that some of these retorts had a life of 3000 working days. Such features as a bench of eights in four vertical rows with only one ascension-pipe (a 9-inch one) to each through retort—some at one end and some at the other—and a bench with one generator for three settings, were well scrutinized, as also were the tar-towers at the bench ends.

In view of the widespread interest in the Sheffield experiences with naphthalene, and the controversies arising out of the remedial measures adopted at various times, the members noted the wooden louvre arrangements for shielding the vertical pipe condensers and preventing the cooling of the gas to the usual degree, and were informed that the condensers had not been in use at all during the past winter, but that the gas reached the washers at between 70° and 85° Fahr., having been reduced to this temperature simply by the use of the foul main. This has four travels along the retort-house, and the gas can be despatched along the whole or only part of these lengths, and its temperature thus kept under entire control.

On the completion of the inspection, the visitors were conveyed to town in special cars, and entertained to tea at the King's Head Hotel by Mr. Morrison, on behalf of the Chairman and Directors of the Company.

A brief meeting followed, at which the members of the Manchester Association took the opportunity of making the presentation of a gold watch, suitably inscribed and engraved, to their late Secretary, Mr. F. Oldfield, of Denton. The President (Mr. H. Smith, of Bury) voiced the general sense of the indebtedness of the Association to Mr. Oldfield for three years' invaluable services, and asked Mr. Morrison to make the presentation. In returning thanks, Mr. Oldfield gratefully acknowledged the generous appreciation of his efforts, and modestly declaimed more than what is so dear to a Briton, a consciousness of having done his best in the carrying out of his duty.

On being called upon for a few remarks on "Joint Action of the Junior Associations," the President of the Yorkshire Association (Mr. W. Cranfield) said he augured well from that day's experiences, and the ease with which the members of the two Associations had intermingled and fraternized for its success. They had assembled that day as the result of a suggestion from

their Manchester friends; and he trusted that many such gatherings would be arranged on the alternate invitation of the two Associations. He pleaded not only for a continuance of such united excursions, but for joint meetings when either Association had anything specially good; such as a lecture from any distinguished engineer or scientist. He looked forward to some joint effort in the way of publishing the papers read to them, either in the form of a book of collected proceedings, or at least in the shape of uniform sized pamphlets, which could be exchanged among the Associations, and bound up at the discretion of the individual members.

The Treasurer of the Manchester Association (Mr. R. H. Garlick) enlarged upon the publication of joint proceedings; saying that so far the expense seemed too large for individual Associations, and urging the actual interchange of papers to be read in person by the authors—such interchange, of course, being prior to publication. He spoke of the need of propaganda work both among and on behalf of the juniors. He referred to some work that had been done by their Association in the way of additional educational facilities obtained, and pressed for the persistence of strenuous effort in this direction, seeing the disparity between the catering of educational institutions for the gas and electric industries.

A vote of thanks to the Chairman and Directors of the Sheffield Gas Company, to Mr. Morrison and his staff, and to Mr. S. Cutler, jun., was then proposed by Mr. Berry (Hyde), seconded by Mr. Sutcliffe (Bradford), on behalf of the two Associations, and supported by Mr. L. Holton, the Secretary of the Manchester Association, and formerly a member of Mr. Morrison's Sheffield staff. All three gentlemen suitably expressed the general feeling of great indebtedness; Mr. Holton adding his personal testimony to Mr. Morrison's habitual interest in young men.

In replying to the vote, which was carried by acclamation, Mr. Morrison explained that Mr. Cutler had been obliged to leave just previously, in order to catch his train to London; but he himself heartily joined in their thanks to him for his great assistance in facilitating the arrangements for inspecting the holder. His (Mr. Morrison's) Company had readily and freely consented to that day's arrangements, as they were always ready to do what lay in their power to help the gas industry. They strove to sell gas cheaply; and in this way they were endeavouring to augment the successes of the gas industry. He had ventured to select Neepsend rather than any of the other works, such as Grimesthorpe, which, being comparatively new, was more of a show place, because he thought he had that day been able to give them greater and more exceptional facilities. They could at any time see the outside of big holders by going where they were; but it would probably be an uncommon event in their lives to be able to see one in course of erection, and to be able to examine it from the inside. He hoped they had made mental notes of much they had seen, and that these would prove of value to them. Of course, one could not constantly be going to large works only. He was always ready to inspect small ones, and many a valuable wrinkle could be picked up at minor works by those who went with their eyes open. He urged all present to embrace every opportunity of inspecting gas-works. When he was young such facilities were rare, and many advantages they now enjoyed were unthought of. He should be glad to take any opportunities which presented themselves of furthering the interests of the two Associations. On some other occasion, even if not in the immediate future, he might have other arrangements of such interest as to warrant the hope that he should see them all again. His assistants had entered heartily into all the arrangements for that day's visit; and he spoke for them all in his thanks and in expressions of pleasure in having seen the members on the Neepsend works.

A letter was read from Mr. Hanbury Thomas, the General Manager and Secretary of the Company, regretting his unavoidable absence, and sending his greetings and good wishes.

Description of the Neepsend Gas-Works.

Coal is received in trucks from the Great Central Railway (adjoining the works), which is at an altitude of about 30 feet above the stage-floor of the retort-houses. It is unloaded down a series of shoots to the level of the houses, where it is broken, elevated, and conveyed to the hoppers of the stoking machinery by seven sets of elevators, &c. The coal-shoots extend over a length of 1300 feet, and are roofed over for the greater part of their length. Adjoining the railway is a large coal-store, having a capacity of 23,000 tons.

The retort-houses are three in number. No. 1, which is 196 feet long by 60 feet wide, contains 18 beds of seven retorts, all hand charged and direct fired. No. 2 is 530 feet long and 76 feet wide, and contains 36 beds of eight retorts, on the regenerator principle, worked by two sets of West's compressed air machinery. In addition there is a bench of nine beds of seven retorts, direct fired, which are to be converted into regenerators very shortly. These will be worked by the existing stoking machinery, with an additional coal breaker and elevator. No. 3 house is 300 feet long and 96 feet wide, and containing 27 beds of seven retorts, on the regenerator principle, worked by one set of West's rope-driven machinery. The whole of these retorts, in the three houses, are about 20 feet long by 22 in. by 16 in. and 21 in. by 15 in., charged every 5½ hours with charges varying from 7¼ to 6 cwt.

On leaving the hydraulic main, the gas is conveyed in 30-inch foul mains, fixed inside and outside the retort-houses, to the condensers, which are of the vertical type and four in number, all protected to keep them free from extreme variations in temperature. No. 1 is 18 inches, No. 2 is 20 inches, No. 3 is 24 inches, and No. 4 is 9 inches diameter. The exhausters are of the horizontal type, direct driven, and three in number; two sets being by Messrs. Gwynne and Co., each with a capacity of 200,000 cubic feet per hour, and the third set (compound) by Messrs. Waller and Co., having a capacity of 225,000 cubic feet per hour. A driving exhauster is also provided for forcing gas from Neepsend to the other stations and governors through a high-pressure main. There are two Livesey washers and two Clapham washer-scrubbers, each having a capacity of 5 million cubic feet per day.

The purifying plant is contained in three houses—No. 1 being 270 ft. by 60 ft., with four boxes 54 ft. by 20 ft. and eight boxes 35 ft. by 20 ft.; No. 2 being 132 ft. by 62 ft., with four boxes 62 ft. by 21 ft.; and No. 3 being 97 ft. by 65 ft., with four boxes 42 ft. by 20 ft. All the houses have upper floors for the revivification of the purifying material, which is elevated by a series of bucket elevators, driven by steam power. There are nine catch boxes, each 20 feet square, charged with oxide.

Four three-lift gasholders, 153 ft. 6 in. diameter and 93 feet high, are provided, each having a capacity of 1,600,000 cubic feet, and the one now in course of construction, already referred to, which will bring up the storage at these works to 14,150,000 cubic feet, and the total storage of all the stations of the Company to 21½ millions.

The station meters are three in number; two being of 100,000 and the other of 250,000 cubic feet per hour respectively. The pressure is regulated by two 30-inch and one 24-inch governor, and a constant supply is ensured by 27-inch and 24-inch safety bye-pass governors. All were made by Messrs. Parkinson and Cowan. A high-pressure main connects these works with the other two belonging to the Company, and also with the three distributing stations in the city.

Tar and liquor storage wells and tanks, having a capacity of 1 million gallons, are provided and equipped with pumps by Messrs. Evans and Co. All the ammoniacal liquor made is sent by a pipe-line 8 inches in diameter to the chemical works at Grimesthorpe, where the Company work it up into sulphate of ammonia. The Company also have sulphuric acid plant, capable of producing 3000 tons of vitriol per annum.

The experimental works consist of a complete gas-works on a small scale, having two settings of three retorts each, together with condensers, purifiers, meter, and two 20-feet gasholders. In conjunction with the plant is the Chemist's laboratory, which is equipped with all necessary apparatus for analytical and research work. The workshops, which have recently been rebuilt, are two storeys high, and measure 144 ft. by 32 ft. They consist of blacksmiths', fitting, and barrow-repairing shop on the ground floor, with stores and carpenters' shop on the first floor. They are equipped with steam-hammer, lathes, punching, shearing, planing, shaping, slotting, drilling, screwing machines, and circular and band saws, &c. The machinery is driven by a 36 brake horse power gas-engine, made by Messrs. W. Grice and Sons. The building is lighted by an installation of high-power incandescent gas-lamps, with a Keith compressor.

The contract for the new gasholder tank was let to Sir John Aird and Sons in October, 1903, and completed in thirteen months. It is 250 feet diameter and 43 ft. 6 in. deep to the level of the rest-blocks, and has a capacity of 8,375,000 gallons. It is built entirely of concrete; the side walls being 5 feet thick for 15 feet in height, then tapering uniformly to 3 feet thick at the coping. In the circumference of the side walls, 28 piers, 5 ft. by 5 ft., are placed (this section being continued to the bottom of the tank). The walls are stiffened by 14 rings of 5 in. by ½ in. bond iron, built in the circumference. An annular space is provided, 7 feet wide, from which the cone of the "dumpling" rises at an angle of 40°, having a ledge 5 feet wide at half its height, and the diameter at the top of the cone being 170 feet. The thickness of concrete at the base of the cone is 18 inches, tapering to 16 inches at the top and to 15 inches at the centre of the tank. The whole of the side walls, piers, and annular space at the base of the cone were formed with concrete, composed of five parts of ballast, one part of sand, and one of portland cement; the cone being formed with concrete consisting of five parts of ballast, one part of sand, and one of blue lias lime. A sump, 12 feet square, was sunk 6 feet below the bottom of the tank, to draw off the water from the foundations (which were carried down to the solid rock), and connected to the tank by a cross trench. The crown of the gasholder is supported by timber framing, and has a rise of 17 feet above the coping. The sides and cone of the tank are rendered with ½ inch of portland cement and sand, finished off with ¼ inch of neat portland cement.

The contract for the gasholder was let to Messrs. Cutler and Sons in June, 1904, and is to be completed by August next. The holder will have a total capacity of 8,113,000 cubic feet, and a working capacity of 7¾ millions. It will consist of four lifts—

Inner	. . . . .	239 ft. 0 in. dia.	× 42 ft. 6 in. deep.
Second	. . . . .	241 ft. 8 in. ,,	× 43 ft. 6 in. ,,
Third	. . . . .	244 ft. 4 in. ,,	× 43 ft. 3 in. ,,
Outer	. . . . .	247 ft. 0 in. ,,	× 42 ft. 0 in. ,,

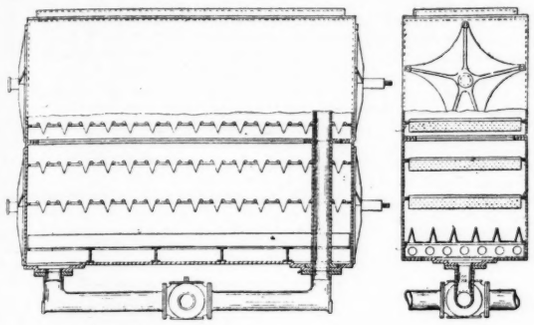
When inflated, the total height to the top of the crown will be 184 feet. The standards are 131 feet high, and the inner lift will rise practically its full height above these. The width of the standard at the bottom is 3 ft. 4 in., tapering to 1 ft. 9 in. at the top, and is built up with a solid web and plated flanges. The standards will be braced together by five tiers of diagonal bracing, consisting of plates and angles, and one plated girder, 2 feet deep at the top, with a platform round the circumference. All the material used on the holder is of British manufactured steel, except the standard bases, which are cast iron. The weights of the holder are: Outer lift, 234 tons; third lift, 223 tons; second lift, 233 tons; inner lift, 418 tons; guide-framing, 767 tons—total, 1875 tons. The following are the approximate costs: Tank, £26,238 = £3 5s. 7d. per 1000 cubic feet of gas; holder, £27,000 = £3 7s. 6d. do.—total, £53,238 = £6 13s. 1d. do.

Interfering with a Gas-Meter.—A man named Philpotts was last week summoned at North Shields for wilfully damaging a prepayment gas-meter belonging to the Tynemouth Gas Company. The defendant visited the house where the meter was; and after he had left, the lock was found to be broken off and lying on the top of the instrument. An official of the Company stated that the money in the meter had not been tampered with. Defendant, who denied the charge, was fined 2s. 6d. and costs, and ordered to pay 2s. 6d. damage.

REGISTER OF PATENTS.

Gas-Purifying Apparatus.—Redman, T., of Bradford. No. 8640; April 15, 1904.

The patentee gives as the object of his invention "to construct and combine with tanks applicable for the purification of gas, grids and staves, or grid-bars constructed so as to utilize to a fuller extent the internal capacity of the tanks, in a manner to prevent the consolidation of the purifying material therein, and thereby to reduce excessive resistance, by packing from weight above, to the flow of gas through same; also to arrange and combine with the tanks, mechanism by which the tanks may be readily removed from, and replaced in connection with, a range of gas-pipes leading to and from the purifying tanks, and adapting them so that the tanks may be mechanically emptied of the purifying agency placed therein, and expeditiously refilled by apparatus constructed and arranged in such a manner as to assist in the rarification, breaking up, or pulverizing of the oxide or like purifying material, and deposit in a purifying tank such material in an efficient manner."



The interior of the "purifying tank" is arranged as shown for supporting a thin metallic grid covering near the bottom of the entire internal area of the tank, and above same to receive one or more series of metallic staves or grid-bars suitably supported. The bottom grid is made in sections. Part of each section is flat and perforated; and in order to obtain strength and a greater capacity than hitherto for the purifying material, as well as a larger area for the admission of gas to it, the remainder of each section is made conical or corrugated in the vertical, and also perforated.

The metal staves or grid-bars are conical in the vertical section, perforated, and adapted to rest on flanges placed at a distance above the bottom perforated grid, so that when the purifying material is placed in the tank the angular or conical sectioned staves support the material, which "in turn forms a base or key for assisting to form and retain a bridge of the purifying material over the spaces between the staves, and thus prevent dense consolidation of the material by reason of arresting its weight and thereby preventing packing and undesirable density at, and towards the bottom of, the tank. "The tier of staves supporting the purifying material above also assist in maintaining the material in a state of comparative looseness, and consequently porous, thereby reducing any excessive resistance to the flow of gas."

In order to mechanically empty and refill the purifying tanks, the gas-pipes leading to and from the tanks are embedded in such a position that when a tank is placed thereon with suitable flexible joint-making material between the flanges of the tank and pipe, gas-tight joints are formed.

The end of each tank is fitted with a strengthening plate, provided with lifting trunnions. One of the trunnions is adapted to receive a spur-wheel. When the tank is raised by hoisting and travelling gear, the wheel meshes with a pinion mounted on the gear frame in such a manner that, on rotating the pinion, the purifying tank is turned into position for emptying the contents into a hopper provided with angular bars across its interior, adapted to assist in the breaking up and rarification of the purifying material deposited in it.

Gas Washer-Scrubbers.—Sheldrake, J. H., of West Norwood, S.E. No. 13,236; June 11, 1904.

This invention consists in improvements upon known and old revolving gas-washing surfaces, and operates upon the gas (differently from heretofore) by causing it to take a less direct, and a much greater, travel to and fro in its horizontal course through the washing and scrubbing material, and so increase the efficiency of the apparatus without adding pressure. This zigzagging and horizontal and forward travel accomplishes the "important and desirable object of preventing the gas short-circuiting by passing from one chamber to another without coming into contact with the washing medium."

A flanged projecting pipe is fixed to the stationary division plate around the centre opening of washer-scrubbers of the rotary type; and to the revolving frame plate, which carries the washing device, is fixed another similar flanged pipe which overlaps the former—the space between the upper and lower flanged pipes being occupied by a flexible material, such as a ring of inverted brushes, which, as they revolve with the frame plate to which they are bolted, are wetted by immersion in the liquor contained in the tank below, and the gas passing through the fibre is washed. Should the shaft sink or move longitudinally the gas cannot escape unwashed, as the fibre is always in contact with the outer side of the stationary flanged pipe, around which it revolves.

Fig. 1 shows a side elevation in section of a gas-chamber, several of which form a complete rotary washer-scrubber. G is the working drum into which fit clusters of devices fixed between the frame-plates B. A is the stationary division plate, and I the shaft upon which the drums revolve (old and well-known parts). E shows the stationary flanged pipe attached to the stationary division plate; D shows the projecting flange pipe fixed to form the plate B; C is the brush fibre; and F, the brush back to which it is fixed. The arrows indicate the course of the gas through the apparatus by the opening H and device G.

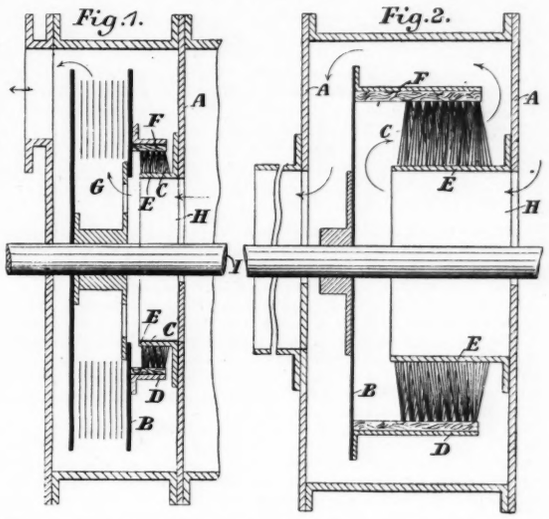
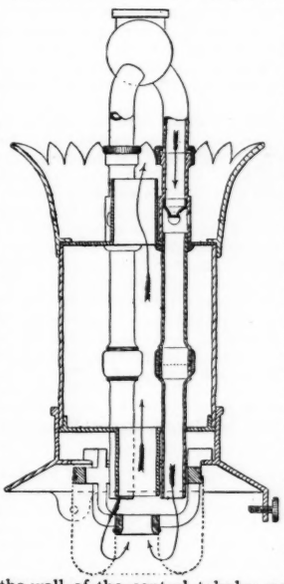


Fig. 2 represents a sectional elevation of the invention when it is to be used as "the washing device and slip of gas washing device" conjointly. This is indicated by the course of the arrows through the brush fibres C.

Inverted Incandescent Gas-lights.—Warry, J., of Birmingham. No. 11,792; May 24, 1904.

The inventor's object is to so construct an inverted incandescent burner that it will heat the gaseous mixture to a high degree before it issues through the lower part to form the flame. Again, heretofore the mantle has usually been made of cup shape attached at the rim to the lower part of the burner; and in practice it is found that the bottom of the mantle is the first part to crack and crumble away, owing to the fact that this portion is not so well supported as the sides. This defect is overcome, according to this invention, by forming the bottom of the cup with a central upwardly projecting cylindrical part, the top rim of which is secured to a central downwardly projecting tubular part of the burner. Thus within the cup-shaped burner there is an annular space between the outer wall of the burner and the inner circular wall formed by the upwardly projecting central tubular part. The lower part of the burner through which the gaseous mixture issues to form the flame is of such a form that the gaseous mixture is consumed in the annular space between the inner and outer walls of the mantle. It thus heats the inner and outer walls and the bottom of the mantle; and then the products of combustion pass through the wall of the central tubular part of the mantle and up a central draught passage above, where there are one or more mixing and heating chambers through which the gaseous mixture passes on its way from the gas and air inlets to the mantle, so that the gaseous mixture is thus heated to a high degree before it issues through the lower outlets to form the flame.

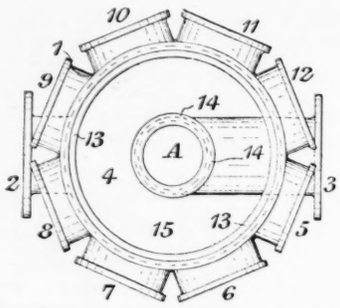


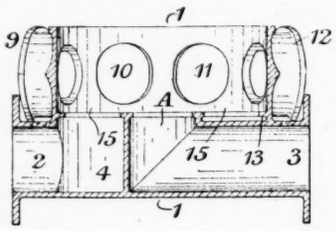
The details of the inverted burner (as shown) adapted to carry the mantle described, and also to form the central up-draught to heat the mixing-chambers, is arranged so that the gaseous mixture enters the top of the mixing-chamber from a pipe forming the nozzle of the inverted bunsen burner; and from the lower part of the mixing-chamber there are pipes or passages extending down to a second mixing-chamber in which is a wire gauze partition. This being heated assists in the heating and mixing of the gaseous mixture as it passes through it, and in the bottom of the chamber there are downwardly projecting pipes which terminate in a flange or nose made with the central draught aperture, and to which the outer rim and the upper edge of the central tubular part of the mantle are attached.

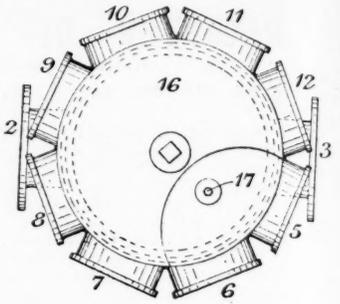
Centre Gas-Valves.—Redman, T., of Bradford. No. 12,658; June 4, 1904.

This invention relates to a combination of parts arranged so as to dispense with the "seal-pot well," or with what is sometimes called the syphon sealed portion of centre valves found necessary with the usual construction.

The outer casing of the valve is formed with branches 2 and 3 for







attachment to the main line of pipes arranged in the ordinary manner. The branch 2 communicates with an annular space 4 within the bottom portion of the casing; the other branch extending inwardly in pipe form, and terminating with an opening A in the centre.

The fixed or outer casing is provided with top branches 5 to 12 for pipe connections; each pair of branches following in numerical order is connected to the inlet and outlet pipes respectively of a gas-purifying box. The centre valve, with eight top branches, is suitable for controlling the flow of gas through four gas-purifying boxes; the attachments between the branches and purifying boxes being made by pipe connections in the ordinary manner.

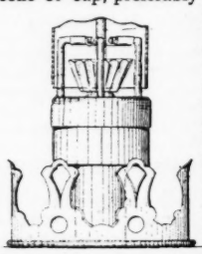
Within the outer casing 1 are two flanged ring supports 13 14, leaving a concentric opening 15 between. These supports are machined, as is also the internal circumference at A; and upon the flanged ring supports rests an internal circular casing 16, machined to fit the circular opening within the circumference A of the casing, and adapted to be rotated therein. The internal circular rotary casing is divided by vanes into a number of compartments suitably covered by a top plate; the number of compartments corresponding to the pairs of top branches 5 to 12 connected and led to and from the purifying boxes.

One of the compartments has an opening formed through the bottom plate of the casing communicating with the annular space 4 below. This compartment is divided from the next by a perforated vane prepared with a flat valve facing on each side for the reception of two wing-plate valves, one of which is mounted on each side of the vane for the purpose of controlling the gas current passing through the valve. These wing-valve plates are pivoted at one end; and each is connected by a link to a lever, one of which is secured to the spindle 17, and the other to a sleeve casing a portion of the spindle—both extending through the cover plate of the internal casing 16. Both spindle and sleeve terminate with a square or other suitably shaped end adapted for engagement with a key lever for operating the wing-valve plates coupled thereto.

By turning the circular casing 16 into a position with the wing-valve plates in contact with the valve facings, the gas, on passing from the annular space 4 through the opening in the bottom plate, enters the compartment with which the branch 5 is connected; and the gas is allowed to flow from the compartment through the branch 5 and the ordinary pipe connection to a purifying box, through which it passes in the ordinary manner, returning to the interior of the rotary casing 16, through the branch 6, into the compartment with which the branch 7 forms a part—the gas escaping through branch 7 to another purifier, from which it returns to the centre valve, through the branch 8. The flow of gas is continued in the same manner through the rest of the purifying boxes connected with the remaining top branches 9 to 12; and finally it escapes, through the branch 12, to the centre opening A communicating with the branch 3, which is connected to the main range of pipes, as is the case with centre valves of ordinary construction.

Flame-Spreaders and Mantle-Holders for Incandescent Burners.—Wolfson, J., of Birmingham. No. 12,377; May 31, 1904.

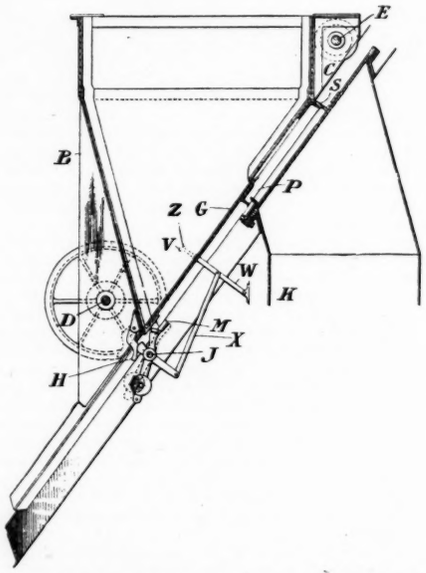
This adjustable flame-spreader consists (as shown) of an inverted cone or cup, preferably of metal, and adapted to slide and be supported at any desired height upon the usual mantle crutch or support, or upon a split central rod or tube fitting into the usual aperture in the burner-head, or attached to it in any convenient manner. The tube may carry any mantle-support, and be provided at any convenient height with a device for steadying the mantle. The device consists of a disc or plate of asbestos, china, porcelain, or like material with two or more depending arms or tongues, and over which the mantle is placed; or it may be in the form of a sheet metal spider, the arms or fins of which are bent to a U or other shape of section at their outer ends, so as to receive strips of asbestos or other non-inflammable material, which, when bent downwardly, act as guides or steadiers for the mantle, and made of such size and shape as not to injure the mantle at the points of contact.



Feeding Coal from Hoppers in Furnaces, &c.—Dempster and Sons, R., Broadhead, J. W., and Radcliffe, J., of Elland. No. 14,858 July 2, 1904.

The patentees provide the hopper with a sliding bottom or base-plate, which on arrival at the feeding aperture is engaged by a fixed catch or projection on the rail or hoist up which the hopper travels, or on the furnace, in such manner that the body of the hopper passes on and allows its contents to be discharged. The hopper is also provided with a catch or projection adapted to engage with the lid or cover of the furnace, so as to carry the lid upwards in front of the hopper, thereby leaving the furnace open to receive contents of the hopper.

The hopper is provided with webs B C for carrying the axles of the wheels D E on which the hopper travels upon rails extending upwards from the position where the hopper receives its charge to a point above the shoot or mouth of the furnace. The sliding bottom G of the hopper is normally retained in its closed position by a step on the trigger H. A fixed catch or projection (shown as carried upon a stud or shaft J suitably supported on the rail or otherwise) is adapted to engage the trigger upon the hopper reaching a certain height, and lift the trigger into the position shown in dotted lines, thereby releasing the slide G from the hopper. Working on the same shaft J is a weighted catch or detent M, and on the slide is a boss or projection which, after passing over the detent M, rests thereon when the slide G is released from the trigger H, as mentioned. The function of this detent is to prevent the slide from slipping down to the bottom of the rails before the return of the hopper. At the front or upper end of the slide is a projection P, which, by engaging with a projection on the inlet of the furnace K, stays the upward progress of the slide in case the slide failed to become detached from the hopper at the proper time.



On the front of the hopper is a projection adapted to engage with the projection S upon the lid or cover of the furnace inlet, and thus to push the lid open as the open bottom of the hopper arrives above the shoot or mouth of the furnace, so as to permit of the discharge of the contents of the hopper.

On the return or downward journey of the hopper, the cover returns by its own weight (or it can be assisted by a counterweight) to reclose the mouth of the furnace, and the trigger H slides over the loose bottom G until it falls into operative position at the lower end. But it is obviously necessary to provide means for disengaging the detent M so as to permit the loose bottom going down the incline along with the hopper. This may be accomplished by any suitable arrangement of linked and pivoted levers. The arrangement shown consists of a bell-crank lever V hinged (so as to be movable only above its hinge) upon the lever W pivoted to a convenient part of the furnace or framework; the lever being linked by bars X Y to the boss of the detent M. A pin or stud Z upon the hopper presses the lever V upwards on the upward movement or advance of the hopper; but on the return of the hopper, the pin Z finds the lever V rigid on the lever, and presses it down until the pin slides over the end of the lever, and the downward movement of the levers V and W, through the links X and Y, forces the detent M into the position shown in dotted lines.

Closing Devices for Gas-Retorts.—Johnson, J. Y.; a communication from the Dessauer Vertikal-Ofen Gesellschaft, m. b. H., of Berlin. No. 15,137; July 6, 1904.

This invention has for its object to provide means whereby the closing devices of gas-retorts can "be operated with ease and certainty of action and without danger to the operators." The invention is described in the specification with reference to vertical retorts, from which it will be readily understood how the invention may be applied to inclined or to horizontal retorts.

In the manufacture of coal gas in vertical retorts, the patentees point

out that it is necessary to operate the closing devices at the discharge ends of the retorts from one side or at a distance from the bench of retorts, in order to prevent the operators being injured by the hot coke on its discharge; and the closing lids or covers employed in carrying out this invention may be of any construction capable of turning, or of being turned, on hinges to open and close the end of the retort.

Fig. 1 is a view of the device as seen from below. Fig. 2 is a vertical section through a bench of retorts. Fig. 3 is a side elevation of the device.

Fig. 1.

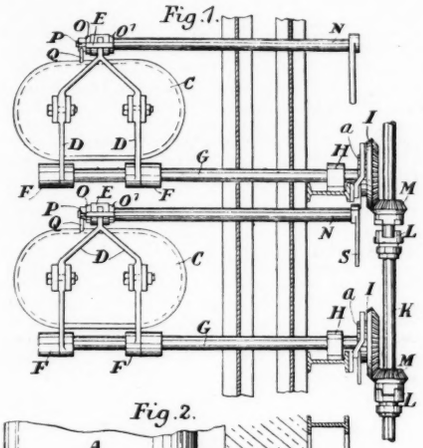


Fig. 2.

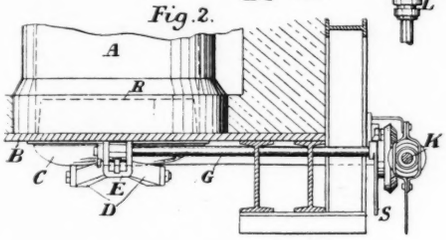
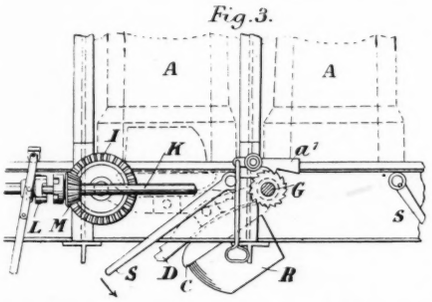


Fig. 3.



The lower end of the vertical retort A is supported on a cast-iron base-plate B, and provided with a lid or cover C hinged to a forked lever D, the forked ends of which extend to the outside edge of the lid or cover, and are rigidly connected to a shaft G mounted in eyes or bearing F on the plate B, which surrounds the ends of the retorts, and in an outer support or bearing H. The opposite end of the lever D projects beyond the opposite edge of the lid, and is engaged when the cover is in its closed position, by a hinged catch or bridge piece E hereafter described. On the shaft to which the lever is rigidly fixed is mounted a toothed wheel I in gear with a pinion M carried loosely ona driving shaft K arranged on one side of, or at a distance from, the retort-bench, and capable of being rotated backwards and forwards by a hand-wheel or its equivalent (not shown); the pinion M being caused to rotate with the driving shaft by means of a sliding-clutch L. The bridge-piece E, by which the lid is retained in its closed position by engaging the projecting end of the forked lever D, is fitted to turn on eccentrics O O^1 on a shaft N extending to one side of the bench of retorts, and provided at its outer end with a lever or handle by means of which the shaft can be turned and which, when turned in one direction, causes the bridge-piece to pass over or on to the projecting end of the lever, and by the eccentrics acting on the bridge-piece the lid is tightly forced against the retort end.

On the shaft N is a pin or projection G, which, when the shaft is turned in the direction to release the lid, comes into contact with a pin or projection P on the bridgepiece E, and forces it out of engagement with the projecting end of the lever D; the eccentrics O O^1 being at the same time turned in the eyes of the bridgepiece so as to remove the pressure thereof from the lever. As soon as the bridge-piece is disengaged from the forked lever, the lid opens by gravity (when applied to vertical or inclined retorts), or it can be opened by rotating the shaft G in the reverse direction to that on which it is rotated for closing it. When the lid or cover opens by gravity, there may be provided on the shaft G to which it is fixed a ratchet-wheel or a friction-wheel with which a spring or weighted arm or detent engages to prevent the door swinging or unduly oscillating. The lid is provided on the interior with a hollow chamber or case R, to prevent undue radiation of heat and to fill the end of the retort that is outside the firing zone of the furnace.

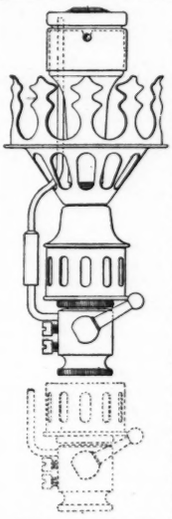
The lids of two or more parallel rows of retorts can be operated from the main driving shaft if the shaft be provided with the necessary sliding clutches and loose pinions to engage with corresponding wheels on the shafts to which the lids are connected. Or a shaft to which the covers of two adjacent retorts are connected may be provided with clutches arranged to be moved into and out of gear with a wheel mounted loosely on the shafts and rotated by a reciprocating rack operated by a crank on a shaft provided with a handle by means of which it can be turned.

The operation of the decice is then as follows: If the retort-lid is to be opened, the eccentric shaft N is rotated by the lever S in the direction of the arrow (fig. 3). This movement causes the eccentrics O O^1 to move so as to raise the hinged catch E and remove its pressure from the lever D, and then, by a further rotation of the shaft, the arm G comes into contact with the pin P and forces the catch E off the end of the lever D; and on the detent being disengaged from the wheel, the cover C falls by gravity. In order that the cover should not swing to and fro so as to prevent the free discharge of the coke from the retort, it is advisable to arrest the motion by causing the detent to engage the ratchet-wheel.

To close the lid, the corresponding clutch L on the shaft K is thrown into gear with the wheel M, and the detent is disengaged from the ratchet-wheel. The shaft K is then rotated by a hand-wheel or the like so as to rotate (through the wheels M and I) the shaft G until the lid comes against its seat. The eccentric shaft N is then turned in the direction opposite to that shown by arrows in fig. 3, thereby bringing the hinged catch E over the end of the lever D of the lid and firmly pressing it down.

Incandescent Gas Lighting.—Bray, J. W., of Leeds. No. 14,084; June 22, 1904.

This invention has for its object, first, the construction of the bye-pass in such a manner that the point of ignition will not be liable to corrosion, and the bye-pass flame is brought within the mantle; and, second, the construction of a burner in such a manner that the bye-pass tube will not interfere with the working or regulating of the air supply to the bunsen tube.



The apparatus by preference is applied to burners having thereon a steatite, porcelain, or like tip, as described in patents No. 5215 of 1903, and No. 5630 of 1903. Attached to, or below, the burner-nipple is the ordinary bye-pass valve; and leading from it, some little distance in an upward direction, is the bye-pass tube. To this tube is fitted into or over, in any convenient manner, another tube leading upwards through the gallery and into the bunsen tube leading towards the burner-head. The burner-tip is attached to a socket fitting into or over the end of the bunsen tube; and in order that the bye-pass tube may enter or be directly underneath the same orifice in the burner-tip, suitable holes are formed in any wire gauze the tube may have to pass through. A vertical groove is formed in the upper portion of the bunsen tube, and a corresponding groove is formed in the socket to which the burner-tip is attached. The illustration shows another method of attachment—namely, a groove or the like is formed in the upper portion of the bunsen tube and a projection formed, by punching or other means, in the cap or head.

It is not essential that the end of the bye-pass tube enters the tip, as it may terminate immediately below it, and the flame will ride on the upper surface of the tip and in a position inside the mantle, but not centrally so.

The bye-pass tube is of considerable length, and will allow of sufficient lateral movement to permit the upper portion of the burner being turned round in order to open or close the air admission holes in the base of the burner.

The upper portion of the burner may be removed and the lower edge of the outer portion of the mixing-chamber form a base or stand for the burner in the ordinary manner, as shown by the dotted lines.

By the arrangement shown, the bye-pass flame when ignited does not burn on the bye-pass tube, but on the top of the burner-tip, and within the mantle.

APPLICATIONS FOR LETTERS PATENT.

10,157.—Salomon, S., and Norden, J., "Attaching mantles to inverted burners." May 15.
10,168.—Keller, R., "Ignition of gas." May 15.
10,174.—Price, H. A., and Turner, F. W., "Gas-fires." May 15.
10,176.—Berger, E. L., "Measuring differences in the pressure of gases." May 15.
10,185.—Beck, C. W., "Acetylene generators." May 15.
10,297.—Walthew, J. G., "Gas-engines." May 16.
10,305.—Burn, R., "Self-lighting burners." May 16.
10,307.—Harris, W. P., and Hemmings, J. F., "Anti-vibrator." May 16.
10,360.—Cook, E. S., and Chipperfield, W. H., "Governing or regulating the pressure of gas." May 17.
10,362,—Weickart, T. H. W., "Gas-cocks." May 17.
10,363.—Weickart, T. H. W., "Incandescent burners." May 17.
10,396.—Harrison, C. W., and Noad, A. C., "Gas-burners." May 17.
10,408.—Jones, D., "Meters, &c." May 17.
10,428.—Potter, W. G., "Gas-engines." May 18.
10,433.—Smith, H. E., "Gas-engines." May 18.
10,439.—Ehmann, C. P., "Incandescent burners." May 18.
10,440.—Pease, E. L., "Manufacture of coke." May 18.
10,496.—Lane, H., "Gas-producers." May 19.
10,504.—Mawle, E. E., "Improving the connection of branch pipes to mains." May 19.
10,570.—Bray, J. W., "Inverted gas-fittings." May 20.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

The Hucknall-Huthwaite Arbitration Award.

SIR,—In the editorial remarks on the above matter in your last issue you say: "As a price could not be agreed upon, the matter was referred to Mr. Ram, K.C., as Umpire, to fix the amount. Unfortunately he was unable to do this, as he could not say definitely, &c. . . . He accordingly sought the assistance of the Courts, and a special case was stated."

Now, Sir, in all fairness to Mr. Ram, I think his position should be clearly laid before your readers. In this matter, the Arbitrators appointed failed to agree upon the form of valuation, and also upon the appointment of an Umpire; the Arbitrator for the Council arguing that a lawyer should be appointed to decide upon a point of law, and the Company's Arbitrator desiring an engineer, as it was a valuation of plant, &c. As no agreement could be arrived at, the Council applied to the Court for the appointment of a lawyer, and, against the Company's requisition for an engineer, succeeded—Mr. Ram being appointed. When the arbitration came on for hearing, Counsel for the Hucknall Council stated that he should have to ask the Umpire to give his decision in the form of a special case upon the point of law to be laid before the Court for its ruling; and to this our Counsel agreed. Hence the reason for the case coming before the Court in the first instance; and it will be perfectly clear to your readers that the position of Mr. Ram as Umpire was unique.

THOMAS JOWETT,
Blackwell, May 26, 1905. Manager and Secretary.

Graham, Morton, and Co. v. Compagnie L'Union des Gaz.

SIR,—Every fair-minded person who was present in Court during the trial of this case must, I think, concur with Mr. Birchenough on his view of Mr. Lucas's evidence. The remarks of Mr. Justice Grantham were, it seems to me, entirely uncalled for; because the evidence of Mr. Lucas did not affect the question at issue. I should not consider it necessary to refer to this matter but for the attitude taken by the "JOURNAL." Admittedly, you are basing your criticisms on the report made by your delegate—who did not see the photographs of drawings produced in Court and which tell the story of the case better than the reported evidence of interested witnesses.

Nobody would, for one moment, think of adversely dealing with the manly defence of Mr. Graham; and all through the trial it was apparent the defendants sympathized with him in the position he was placed in by the work of those acting under his subordinates. Had Mr. Hamilton not shown the courtesy and consideration he did, and had he followed the principle adopted by his learned friend, he would have been fully justified, and perhaps the result would have been different.

I agree with Mr. Marshall, especially in his reference to the alterations at Granton. It is evident that you have not seen the drawing which was produced in Court, which was really only a cartoon—being without dimensions or scale (with the exception of one figure which was added on being reproduced).

It is only fair to Mr. Herring that he should explain why drawings were published in the "JOURNAL," after Granton was set to work, which differ entirely from the one produced by the plaintiffs. Does Mr. Herring have to clinker his fires every eight hours, as at Milan? If so, he might well adopt the "Bourne" grate, which Mr. Bourne said allowed him to dispense with 24 men on 32 beds.

Perhaps Mr. Graham is not aware that the drawing of Meadow Lane which he produced does not show the benches as actually built.

ARCH. S. B. LITTLE.
Smethwick, May 24, 1905.

[It has been a question of some doubt with us as to whether we ought not to refrain from publishing the above letter, in view of the fact that, as seen by the joint letter published elsewhere from the Solicitors of the defendants and plaintiffs in the Milan contract action, the Directors of the Company have "unreservedly" accepted the decision of Mr. Justice Grantham. But it is not the first time that in exercising our right of declining the publication in the "Correspondence" columns of letters that we have thought ill-advised, that we have been charged with one-sidedness. Therefore our correspondent is allowed his say. Most men will question Mr. Archibald Little's discreetness in this particular matter; and when a Judge of the High Court frees a firm from the imputation of bad work, and when the other parties "unreservedly" accept the decision, it is a questionable proceeding—if not closely touching the danger line—for anyone in Mr. Little's position to say that the defendants apparently sympathized with Mr. Graham "in the position he was placed in *by the work of those acting under his subordinates.*" There is still the allegation here of bad work; so that even now Mr. Little does not accept what the Directors have unreservedly accepted. We cannot admit that Mr. Little has right to assume any deficiency of knowledge on our part concerning this Milan case. Photographs and drawings have only supplied part of our knowledge of many inner matters of various kinds, of which perhaps Mr. Little has not even a suspicion.—ED. J.G.L.]

Suicide by Gas Poisoning.—Last week a husband and wife named Le Couteur, who owned a photographic business in the West End of London, driven to despair by financial worries, sat down in their kitchen near the gas-stove, the taps of which they turned on, and so put an end to their existence

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills read the first time and referred to the Examiners: Local Government Provisional Order (Gas) Bill, Rhondda Urban District Council Bill, Rhymney and Aber Valleys Gas and Water Bill.

Bills read a second time: Andover Lighting and Power Bill, Gas Orders Confirmation Bill.

Bills reported: Accrington District Gas and Water Board Bill, Aylesbury Gas Bill, Bangor (County Down) Water and Improvement Bill, Brentwood Gas Bill, Colne Corporation Bill, Croydon Corporation Bill, Croydon Gas Bill, Great Berkhampstead Gas Bill, Llandrindod Wells Urban District Council Bill, Mansfield Corporation Bill, Matlock Bath Improvement Bill, Morley Corporation Bill, North Sussex Gas Bill, South Oxfordshire Water and Gas Bill, Whitby Urban District Council Bill.

Bills read the third time and passed: Bangor (County Down) Water and Improvement Bill, Epping Gas Bill, Great Berkhampstead Gas Bill, Higham and Hundred of Hoo Water Bill, Hythe Corporation Bill, Loughborough Corporation Bill, Mansfield Corporation Bill, Nottingham Corporation Bill, Seaham Gas Bill, South Metropolitan Gas Bill, South Suburban Gas Bill, Tees Valley Water Board Bill, Western Valleys (Mon.) Water and Gas Bill, Whitby Urban District Council Bill.

A petition against the London Gas Bill has been presented by the Institution of Gas Engineers.

HOUSE OF COMMONS.

The following further progress has been made with Bills:—

Bills brought from the Lords, read the first time, and referred to the Examiners: Bangor (County Down) Water and Improvement Bill, Hythe Corporation Bill, Mansfield Corporation Bill, Nottingham Corporation Bill, Tees Valley Water Board Bill, Western Valleys (Mon.) Water and Gas Bill, Whitby Urban District Council Bill.

Bills reported: Bolton Corporation Bill, Local Government Provisional Order (Gas) Bill.

Bills read the third time and passed: East Cowes Gas Bill [Lords], Local Government Provisional Order (Gas) Bill, Rhondda Urban District Council Bill, Tralee Urban District Council Bill [Lords].

The Bootle Corporation Bill and the Malvern Water Bill have been referred to a Select Committee, consisting of Sir James Woodhouse (Chairman), Captain Bagot, Mr. E. Haviland-Burke, and Mr. Fitzroy; to meet to-day.

HITCHIN GAS BILL.

House of Lords Committee.—Thursday, May 25.

(*Before Lord* NEWTON, *Chairman, Duke of* WELLINGTON, *Marquis of* WINCHESTER, *Earl of* GAINSBOROUGH, *and Earl of* ROSSE.)

This was a Bill which sought to make the Company a statutory concern, and to confer further capital powers.

Mr. BALFOUR BROWNE, K.C., Mr. CLAUDE BAGGALLAY, K.C., and Mr. PADDON, appeared for the promoters, the Hitchin Gas Company; Lord ROBERT CECIL, K.C., and Mr. HUTCHINSON, represented the petitioners, the Hitchin Urban District Council.

THE CASE FOR THE PROMOTERS.

Mr. BALFOUR BROWNE, in opening, said the Company was formed in 1834. No complaints had ever been made of the quality of the gas, which was of 17-candle power, and was sold at 3s. per 1000 cubic feet; being the lowest price charged in the county of Hertford. The gas was supplied for the public lamps at 2s. 5d. per 1000 cubic feet, which was very low. The capital was only £7000, and only 10 per cent. had been paid as dividend for the last 30 years. The Company had already borrowed £8000, and arrangements had been made for a further loan of £6000 for a new holder, which would be repaid out of the capital raised under the Bill. The Bill was exceedingly simple. By clause 5, the old Company was dissolved and re-incorporated as a statutory concern. By clause 20, the capital was fixed at £50,000, and the dividend, with a sliding scale, at 5 per cent. In the other House, his learned friends who appeared for the Hitchin District Council, said there was a rule of Parliament that when a non-statutory company asked to be made a statutory company a clause should be inserted in the Bill authorizing the council, if it chose, to give notice within a certain time to purchase the works. He denied that there was any such rule. Such a clause had been inserted in a considerable number of cases; but it was for the Committees of both Houses to determine the question. If there were such a rule, it would tend to prevent companies coming before Parliament, which would be inimical to the interests of the public. He thought this was the only point at issue.

Lord R. CECIL said other questions would be raised besides that of purchase.

Mr. BALFOUR BROWNE said that was the only point raised in the other House. His learned friend had not called any evidence, but relied entirely upon a speech. The Committee then passed the Bill without the purchase clause. But notwithstanding this decision, the Hitchin Council attempted to get the Member for the division in which Hitchin was situate to move that the Bill should not proceed without a purchase clause. When the Bill came on on the evening of Tuesday,

April 11, Mr. Hudson withdrew his opposition without giving any reason. Mr. John Burns expressed his regret at this course being taken by Mr. Hudson; and Mr. Hudson explained that he had been misled by the Urban District Council. Since then, the ratepayers had been consulted, and the learned Counsel believed, as Mr. Hudson said, that a large number were against the purchase clause. At one time Parliament was much more favourable to the purchase by local authorities of gas companies' undertakings than they were at present. Only two years ago they entrusted to the Hitchin Urban District Council the electric lighting of the town; and he submitted it was not desirable that all means of lighting should be in the same hands. The Council had made an offer of £33,250, which was to include mortgages and debentures amounting to £14,000; leaving £19,250 for the shareholders. This was grossly inadequate.

Mr. *Arthur F. Phillips* was the first witness called. In reply to Mr. CLAUDE BAGGALLAY, he said the works of the Company were exceedingly well constructed, and sufficient for an increase of 40 per cent. on the present output. The site was very good. The structural value of the land and buildings he put at £32,000.

Lord R. CECIL: Why do you want statutory powers?

Witness: It is better to have a company properly regulated.

With regard to the reserve fund, £3500 is a large one, is it not?—It is large in proportion to the capital, but not in proportion to the works.

It may be regarded as capitalized profits?—Yes.

The balance of profit to June, 1899, was £3682. You did not apply any portion of the money to the reduction of the price of gas?—It was either applied in the reduction of price or extension of works.

It has been the policy of the Company to build up capital out of revenue?—Yes.

In reply to further questions, witness admitted that when the Bill was first introduced in the House of Commons the standard price asked was 4s. This was afterwards reduced to 3s. 9d., and then to 3s. 6d., which he thought was fair. The Company were asking for £36,000 additional capital, because in future they would exist under very different conditions. If the purchase clause were inserted in the Bill, all that would happen would be that the ratepayers could then decide whether they would purchase or not. The moral effect of such a clause, however, was great.

The purchase clause has always been granted during the last 25 years, when asked for, has it not?—I am not able to mention a case where it has been refused.

The CHAIRMAN: Did I understand you to say that this purchase clause in the case of non-statutory gas companies has never been refused?

Witness: Yes.

This is the solitary exception?—Yes.

Mr. PADDON: I am afraid we can only plead our success up to this point; but we say the circumstances are very exceptional.

Mr. *Corbet Woodall* was next called. In reply to Mr. PADDON, he said that it was desirable to encourage gas companies to come to Parliament for statutory powers. As to the capital powers asked, they were very fair, and would be expended in about thirteen years. He thought 3s. 6d. was a fair standard price. It should be so fixed as to safeguard the shareholders from possible loss owing to circumstances over which they had no control. There was nothing to be gained from transferring the Company's undertaking to the Local Authority. As to the suggested competition between the Company and the Local Authority, that might be discussed at once. He believed the Local Government Board had a rule that no local authority should be permitted to raise money for the purchase of gas-works unless they had first settled with the gas company who were in possession.

Cross-examined by Mr. HUTCHINSON: £19,000 is the amount of the difference between the money borrowed, *plus* the capital subscribed, and what has been expended upon the undertaking—viz., £40,000. Dividing this into 30 years makes £600 per annum, which upon £7000 is 8½ per cent.; so that the Company has been returning you 18½ per cent.?

Witness: That is a most perverse way of looking at it. These people, instead of putting the money into their pockets, put it into the works; and upon this they have had no return whatever. If they had put it in their pockets, the works would still have had to be extended; and upon the money raised for the purpose, the consumers would have had to pay a dividend.

The CHAIRMAN: How long will the capital asked for enable you to be free from coming to Parliament?

Witness: I have taken the average of the last five years, in which there has been an increase at the rate of 5¾ per cent.; and upon this the business will have doubled in thirteen years. As the capital is doubled, it will last thirteen years.

In re-examination by Mr. PADDON, witness said that the profits which had not been taken by the proprietors had been devoted to the use of the consumers, without charge.

Mr. *E. L. Burton* supported the Bill in regard to the capital proposed to be raised, and the standard price of 3s. 6d. The Bishops Stortford Gas Company, of which he was Chairman, when they promoted their Bill in 1903, had agreed to a purchase clause with the Local Authority—the option to last a year. The ratepayers had not so far exercised the option. There was even more reason why it would not be advantageous for the Local Authority to purchase in the case of Hitchin. The management was excellent; it could not be better.

Local witnesses were called proving that the Bill had been approved of by the Ickleford and other neighbouring villages, at meetings of the Parish Councils.

THE CASE FOR THE OPPOSITION.

Mr. *Lawson Thompson*, the Chairman of the Hitchin Urban District Council was then called in opposition to the Bill, and examined by Lord R. CECIL. He commented on the large profits made by the Company in the past, which he said influenced the Council in desiring that it should not be made into a statutory company.

Mr. *F. W. Phillips*, a resident of Hitchin, said he had not heard a single dissentient voice in regard to the desirability of purchasing.

Mr. *W. O. Times*, the Town Clerk of Hitchin, gave evidence in support of the purchase clause. In cross-examination, he admitted that the consumers would not be benefited; but as ratepayers they would have the management of their own gas undertaking.

Friday, May 26.

Mr. *George Spurr* was called as a local witness by Lord R. CECIL to say he was dissatisfied with the price of gas which had been charged by the Company, having regard to the profits they had made. The Council were unanimous as to the desirability of purchase. On this latter point, witness was supported by Mr. *Moss* and Mr. *Wilmot*, two members of the Council.

Mr. *H. E. Jones* was then called, and, in answer to Mr. HUTCHINSON, said that it was very unfortunate that there were no proper accounts kept by the Company, showing the expenditure of capital. He had never known of a case where a purchase clause had been refused by Parliament in similar circumstances. The Company had been earning and allocating for their own purposes profits at the rate of 18½ per cent. for the last thirty years, which was quite unique. He saw nothing in the position of the Company to differentiate it from other non-statutory concerns where a purchase clause had been given. He thought that public opinion in the town would not have tolerated what had been going on if it had known the profits made. Companies were allowed capital powers to last them from twelve to fifteen years before coming to Parliament again. In the present case, the £38,000 new capital asked for would last twenty years, and was not reasonable. He thought the proper amount of capital was £15,000, and £5000 of debenture stock. If the purchase clause were given, they were willing that they should be confined to one year. In this case, the Company would know one way or other as to purchase in four or five months.

In cross-examination by Mr. CLAUDE BAGGALLAY, witness said he was aware that the trading profit for last year was £2411. He agreed that £7000 was a small capital. It was about £350 per million cubic feet. He thought £600 per million was an equitable figure. He did not consider the Company had erred in the way of burdening the undertaking with dividend-bearing capital. As to what was a fair price for gas, it was dependent upon many things. He admitted that he was not a strong advocate for purchase of gas companies by local authorities, but where a company had abused its position somewhat, then he agreed with purchase. The present case was an instance of that. He hung the whole of the case for purchase upon the fact that the Company had used money which, in his view, belonged to the consumers for capital purposes.

SPEECHES OF COUNSEL.

Lord ROBERT CECIL said that in some respects the Company had been admirably carried on—viz., as a commercial undertaking—but he could not agree it had been carried on so admirably in the interests of the consumers. It was true that the price charged for gas was not higher than the price in many towns in the neighbourhood. The real test, however, was whether the Company had suppled gas as cheaply as they could after giving a reasonable profit to the shareholders. The whole question was, Was the dealing with the capital which the Company had indulged in fair or unfair? They had, in fact, earned their capital out of revenue. Unquestionably this was an unusual course, and would not be allowed in the case of a statutory company. The real object of the Bill was to get over section 161 of the Public Health Act, 1875. Parliament distinctly said that the local authority were to be entitled to supply gas unless there was in their district a statutory company. The Council, therefore, asked for the purchase clause. They were willing that the shareholders should receive the full value of their undertaking, and they should be bound to come to Parliament within the next year. Then they said that the capital was very much too large. The £36,000 asked for was more than double the capital which had been expended during the whole seventy years of their existence. The Council asked that it should be reduced to £15,000, and £5000 of debentures. As to the standard price, it was not seriously contended that 3s. 6d. was fair. The accounts showed that they could, in fact, reduce the price without loss to something like 2s. 6d. per 1000 cubic feet. The present charge was 3s.; so that if 3s. 6d. were passed it would authorize them to pay not 10 per cent., but some 12 per cent. Probably 2s. 10d. would be a fair standard price. Then the Council thought the Company should be confined to the Hitchin district, and not go outside, as they asked.

Mr. CLAUDE BAGGALLAY differed from his learned friend with regard to a local authority having the duty to light. The statutes had drawn a distinction between gas and water. In matters of water supply, the statutes had been very express that it was the duty of the local authority to see that its district was properly supplied with water. With regard to lighting, there was merely a permissive power to the local authority if there was not a company doing the work. Before the Cowes case in 1896, the only instance in which purchase was put upon a company was where a local authority came with its own Bill to purchase the undertaking; and then it had to show serious misconduct of its business on the part of the company. There were several cases before 1896 in which serious misconduct had been proved; and in a certain number the purchase clause had been granted. In the Whitby Bill, the Committees of both Houses had refused to adopt the suggestion of inserting a purchase clause; and in the case of Cowes, their Lordships' House had followed that—Lord Camperdown's Committee refusing to insert a purchase clause. In the other House, serious complaint was made against the Company, particularly as to their habit of breaking up the streets of Cowes when the Regatta was on; and the result was that the House of Commons Committee overrode the decision of the Lords Committee, and inserted a purchase clause. Since 1896, there had been a general tendency on the part of Parliament to insert purchase clauses in non-statutory companies' Bills; but that had not been an absolutely invariable rule. The Board of Trade had refused over and over again to insert it in Provisional Orders; and Parliament had refused also in

some cases to insert it in such Provisional Orders unless the parties agreed there should be a purchase clause. He asked the Committee to consider the matter upon its merits.

THE COMMITTEE'S DECISION.

The room was then cleared. On the re-admission of parties,

The CHAIRMAN said: The preamble of the Bill is proved, subject to the insertion of a purchase clause. There is no other alteration.

On the application of Mr. BALFOUR BROWNE it was agreed this clause should be drafted and brought up on Monday (yesterday).

LONDON ELECTRICITY SUPPLY BILLS.

The Position of the Gas Companies.

The Select Committee of the House of Lords presided over by Lord CAMPERDOWN decided last Monday week that the Administrative County of London and District Electric Power Company's Bill, and that of the Metropolitan Electric Supply Company (Various Powers) might proceed.

The CHAIRMAN stated that when they came to the part of the Bill dealing with the matter of area, they had decided to give to the Administrative County the non-industrial area south of the River Thames, and to the Metropolitan Company the non-industrial area north of the river. To the former would be assigned the industrial area as it was. So far as the various Companies were concerned, the Committee had decided to insert in the proper place a clause in principle in the Bills—as suggested by the Hon. J. D. Fitzgerald—to the effect that the Board of Trade should have the widest possible power to deal with the circumstances of each particular case, and would be specially called upon to consider the case of a company or undertaking purchasable by the local authority at the expiration of 42 years.

The Committee subsequently dealt with the clauses of the Administrative County Bill.

THE SOUTH METROPOLITAN GAS COMPANY'S CASE.

On clause 30, Lord ROBERT CECIL, who appeared for the South Metropolitan Gas Company, mentioned that a discussion had taken place upon the question of some land which the promoters proposed to take at Greenwich; and they had scheduled land which belonged to the Gas Company. He did not quite follow what amendments they had made. They undertook to exclude all the South Metropolitan Company's land; but he did not know that there were any amendments which carried this out.

Mr. J. D. FITZGERALD explained that the matter stood thus: On behalf of the Company he said that, provided they obtained access to the South-Eastern Railway, they did not want to take any of the South Metropolitan Company's land, but that either they must give them access over the siding they were constructing themselves—an undertaking to construct the siding so that they should have access—or they must be allowed to take so much land as was necessary to construct the siding themselves. He could not help thinking if this clause was postponed, and the parties met, they would be able to agree.

Lord ROBERT CECIL said he was instructed that his clients had never received any proposals from the Company at all.

Mr. FITZGERALD remarked that they had endeavoured to arrange an interview, but had been unable to do so.

The CHAIRMAN, after discussion, said the Committee would postpone the clause; but the parties must endeavour to carry out the agreement that had been foreshadowed.

THE GASLIGHT AND COKE COMPANY'S CASE.

Mr. WILKINSON, who appeared for the Gaslight and Coke Company, said that one of the generating stations which the Company desired to acquire was situated at Fulham. He submitted that no evidence had been given that it was necessary to acquire the land at all.

Replying to Lord LYTTON, Counsel said there was some suggestion that the land was advertised for sale; but no proof of it was given.

The CHAIRMAN: If you advertise the land for sale, and supposing these people pay what an arbitrator says is a fair price for it, what is your objection?

Mr. WILKINSON: The first point is that they are going to compete with us—so far as they supply electricity for power and so far as we supply gas for power, we are in competition. There is a further point. This particular land is subject to a statutory disability; and we are not able ourselves to manufacture gas upon it. These people would be able to use the land and manufacture gas. By clause 30, they might manufacture gas.

The CHAIRMAN: Yes; but I think it was gas for the purpose of generating energy. It was not for selling.

Mr. WILKINSON said that was so; but the point now was this: They could not make gas at all upon the land. They might make gas not for the purpose of distribution, he admitted; but Parliament in its wisdom many years ago said that they were not to make gas on it. Surely if gas was manufactured by an electric lighting company on the land, it would not be less a nuisance to the neighbourhood than if they manufactured it? Counsel then read clause 12 of the Imperial Gas Act of 1866.

Mr. BALFOUR BROWNE asked that a witness should be called on this point.

The CHAIRMAN: You declined to call a witness. This case was taken on preamble.

Mr. BALFOUR BROWNE said if the land was to be used for any manufacturing purposes at all, as the promoters said it was, it should not be taken out of their hands. It was a hard thing to have this land forced from them when the promoters probably would not want it for forty years to come. There was no evidence that this station would be required immediately; and the alteration of the area made a great difference. They had no longer the West-End; and Mr. Fitzgerald had said that the whole area could be supplied from the other station. Under these circumstances, he asked the Committee to leave the land of this Company alone.

The CHAIRMAN: Then when we come to sub-section 3 of the schedule, we shall decide to leave that in as part of the schedule.

THE SOUTH METROPOLITAN COMPANY'S CASE AGAIN.

On the following day, Mr. KENNEDY brought up clause 76 K, and said he had drafted it the previous night and supplied the petitioners with a copy. He did not know whether they accepted it. It was their proposal to give effect to what they understood was the arrangement suggested by Mr. Fitzgerald and accepted by Sir George Livesey.

Mr. ROSTRON said they objected to the clause. As regarded the first sub-section, it ran: "Notwithstanding anything contained in the deposited plans or contained in this Act, the Company shall not, except as hereinafter provided, without the consent of the South Metropolitan Gas Company (hereinafter called the Gas Company) enter upon, take, or use the properties numbered 2, 9, 10, 11, and 12 in the parish of Greenwich on such plans." So far as this sub-section was concerned, they made no objection. They did not object; it being understood that it would prevent the Administrative Company taking any part of the land except by agreement. With regard to the rest of the clause, they did object. It would be seen that the next four sub-sections—2, 3, 4, 5—would compel them, within six months of the passing of the Act, to construct their railway and give the promoters running powers over it. He objected to these sub-sections for this reason. In the first place, it was not a clause which their Lordships could put upon them, for the simple reason that it was not asked for by the Bill; and if it was put upon them, he understood it would have to be struck out under Standing Orders.

Mr. KENNEDY said this was a protective provision inserted as a matter of arrangement between the parties.

The CHAIRMAN observed at this point that, with regard to the South Metropolitan Gas Company, he would have to leave the matter to the other members of the Committee because he could not take any part in it, although he might ask a question occasionally.

Mr. ROSTRON recapitulated what the position was when Sir George Livesey went into the chair—that the promoters had scheduled part of their land at Greenwich. What he meant was that, instead of making an agreement, as he understood was now suggested, they should construct the siding at once and give them access over it. What he said was, if the promoters got their Bill through Parliament, and obtained power to put the generating station down and the siding was made, then, as business men, they could probably make some arrangement for their going over it. This was what he was sure Sir George Livesey intended to say.

The CHAIRMAN: Then you propose that they should put up this very expensive generating station without any access to it.

Mr. ROSTRON: We wish to reserve our right to appear in the other House, and ask that they shall not be allowed to place their generating station on this site at all. I may appear to ask your Lordships to strike our land out of the Bill.

The CHAIRMAN: Then in that case you will have power to appear in the other House.

Mr. ROSTRON: Ours is a preamble decision; and your Lordships have not given any decision upon it.

The CHAIRMAN: You are asking us to throw the Bill out altogether?

Mr. ROSTRON replied that that was not so. He asked that the Committee should strike out all reference to their land, or all compulsory powers as to the land, from the Bill.

The CHAIRMAN: Then that is on clauses?

Mr. ROSTRON: I thought it was on preamble.

The CHAIRMAN: You must run the risk of that.

Mr. ROSTRON said the point he was dealing with was that it was put that they had agreed to construct this line at once and give them running powers over it.

The CHAIRMAN: No; the evidence does not show that you had agreed, so far as I understand it; and I do not suppose it is so said.

Mr. HONORATUS LLOYD: It is not.

The CHAIRMAN: Then there is no difference between you. Now the promoters put forward a clause distinctly proposing to compel you to finish this siding within six months, and asking that they may use it.

Mr. ROSTRON said he objected to having this clause put upon him because he thought he ought to be entitled to make his railway at his own convenience, and not at the time when it suited the promoters of the Bill. He thought also—although certainly Sir George Livesey answered very frankly in the box—it was a matter which his Board would like to consider as to whether or not it would make a great deal of difference to them if running powers of this sort were given; and this they had never had an opportunity of doing. He might add, also, that this clause put a new statutory obligation upon them.

Mr. HONORATUS LLOYD observed that the proposal of the Bill was to take certain lands of the Gas Company compulsorily. This, as had been said quite truly, was not necessary for the purpose of the construction of the generating station, but was necessary for the purpose of getting access to the adjoining railway.

Lord ZOUCHE: Then you could get access to the generating station without this railway.

Mr. HONORATUS LLOYD replied that they could get access by road, but not by railway. He would like to make a further suggestion. If their Lordships thought right to authorize them to take any of the land compulsorily, they should not take more than a certain quantity, and they should not take any in the event of the Gas Company constructing the siding and using it.

Lord ZOUCHE: The Committee thought first of all that if the Gas Company are not prepared to carry out sub-section 2 of clause 76, relating to the construction of the branch railway within six months, that then the Administrative Company should be given powers of compulsory purchase.

Mr. LLOYD: That is what has substantially occurred to me.

The CHAIRMAN: Then you will have to alter the clause to carry that out; and the clause will be postponed in the meantime.

Clause 76 K was then postponed.

The Kingston Gas Company's Position.

Mr. Hutchinson, subsequently, on behalf of the Kingston Gas Company, said he had three new clauses to bring up. Two of them had been submitted to the promoters; and the third was a clause which was consequent on the decision of the Committee in the case of the Metropolitan Water Board, with respect to the protection of pipes and damage caused by electrolysis as the result of laying the Company's mains.

After discussion, the Committee refused the first two clauses, and accepted the third, which was inserted in the Bill.

The Dartford Gas Company's Position.

On Wednesday, Mr. Lees submitted an amendment to insert the words "Dartford Gas Company" in the Kingston clause. He said there was no difference whatever between the two Companies.

The Chairman said the question was whether the Committee would go back on the Bill.

Mr. Lees said he only wanted to save the trouble of opposing in the second House, because it was obvious that what the Kingston Company were entitled to the Dartford Company were entitled to under similar circumstances. He had a petition presented for the Dartford Company.

The Chairman regarded the application as irregular, and said the Committee declined to agree to it.

The Brentford Gas Company's Case.

On the consideration of the clauses of the Metropolitan Electric Supply Company (Various Powers) Bill,

Mr. Wilkinson, on clause 3, moved, on behalf of the Brentford Gas Company, to strike out the letter "s" in "sections," and the words "and 81," explaining the amendment by saying that he objected to the promoters being exempt from section 81 of the Electric Lighting Clauses Act, 1899, which was the General Act, and which, he contended, applied to cases of this sort. The section was as follows: "Nothing in the Special Order shall exonerate the undertakers from any indictment, action, or other proceedings for nuisance in the event of any nuisance being caused or permitted by them." To give an example, it was proposed that energy should be transmitted through certain districts. He represented a gas company, who were now supplying gas in very nearly all the districts which were mentioned in clause 4 of the Bill; so that it was of extreme importance to them to see, as a gas company, that the electric lighting company who supplied in their district—at any rate who brought the mains through the district they supplied—should be subject to the liability for nuisance if they committed it. He pointed out that, under the Gas-Works Clauses Act of 1871, which applied to gas companies, the exact facsimile of the clause was included—section 9. They were in this position: If their gas escaped and created a nuisance, they were liable; but if the promoters' electricity in the same district escaped and caused a nuisance, unless this clause was inserted in the Bill, they would not be liable. He submitted that there was no reason at all why the clause should be exempted in the case of this Company.

Mr. Ram said, as far as he knew, it was the first time that anybody had suggested that this section 81 should apply to an escape of gas or electricity otherwise than at a generating station.

After further argument, the question was put and the amendment agreed to.

On clause 5, Mr. Wilkinson proposed a clause on behalf of the Brentford Gas Company, which he said might be called the "electrolysis" clause. It was in exactly identical terms to that passed in the last Bill on behalf of the Kingston Gas Company.

The clause, having been amended, was agreed to.

The other clauses having been considered, were all agreed to with amendments and additions; and the preamble having been agreed to, the Chairman was directed to report the Bill as amended to the House.

LONDON COUNTY COUNCIL (GENERAL POWERS) BILL.

The Supply of Electric Fittings, &c.

Last Wednesday the Police and Sanitary Committee of the House of Commons, Mr. J. W. Wilson (Worcester) presiding, considered the electrical part of this Bill.

Counsel for the promoters were Mr. Freeman, K.C., Lord Robert Cecil, K.C., and Mr. Lushington. The petitioners in opposition were represented as follows: The Gaslight and Coke, South Metropolitan, and Commercial Gas Companies, by Mr. Balfour Browne, K.C., and Mr. R. Neville; the Brentford and Wandsworth and Putney Gas Companies, by Mr. R. Neville.

The principal clause relating to the supply of electric fittings by Metropolitan Borough Councils (No. 63) was as follows:—

> It shall be lawful for the Council of any Metropolitan Borough, being authorized to supply and supplying electrical energy, to expend money upon the wiring and fitting and supplying with wires, fittings, motors, and apparatus the premises of their consumers, or prospective consumers, and to enter into, and carry into effect, agreements and arrangements with respect thereto; and to make such charges therefor, whether directly or otherwise, as they may think fit.

Lord R. Cecil pointed out that the power to expend money on electric fittings was given only to boroughs supplying electrical energy under the authority of a Provisional Order or Act of Parliament, and, further, that the power was not given to the County Council directly, but to Metropolitan boroughs. The country precedents for the proposal were so numerous as to show that in the country it had become practically a matter of course, if a corporation applied for the power, to grant it. Twenty of the Metropolitan Borough Councils had written to the London County Council asking them to seek legislation of this character; and at a Conference of Local Authorities convened by the Hackney Borough Council on Feb. 8, 1904, a resolution urging the County Council to apply to Parliament for such powers was passed. In answer to criticisms that they ought to take care that this was not done at the expense of the rates, the Council were prepared to insert a proviso: "Provided also that every such Council shall, so far as reasonably practicable, so adjust the charges to be made by them as aforesaid as to meet any expenditure by them under the powers of this section." Turning to the j int petition of the three Gas Companies, he said they alleged that the powers proposed to be granted by this part of the Bill would enable the Councils of the Metropolitan Boroughs to throw upon the rates the cost of wiring and fitting, and supplying with wires, fittings, and apparatus, the premises of their consumers, or prospective consumers, and that thereby the petitioners might be compelled, as ratepayers, to contribute largely to the maintenance of competition with their own undertaking; and they submitted that such rate-aided competition was unfair, and ought not to be sanctioned. So far as this was a valid objection, the promoters had tried to meet it by means of the proviso. The petitioners further submitted "that where it is thought desirable to authorize local authorities to carry on undertakings for the supply of electric light, it is reasonable and just that provision should be made for securing that such undertakings shall not be carried on at the expense of such of the ratepayers as do not require, or cannot afford to take, a supply of electricity." This appeared to go further than anything that arose in the Bill. The only proposal now made was to supply fittings.

Mr. Balfour Browne: It is not only fittings. You have put the word "motors" in the filled-up Bill.

Lord R Cecil: I did certainly contend that the supply of small motors is part of "fittings."

Mr. Balfour Browne: You have not put in "small" motors.

Lord R. Cecil: It is clearly included in "apparatus." "Motors" is put in to make it clear that we intend to include these small motors in "apparatus." Continuing, he said that the words had been taken from the country precedents and from the Woolwich Act. The petition went on: "As regards the undertakings of certain of the Metropolitan Borough Councils having powers for the supply of electricity, clauses have been inserted at the instance of one or other of your petitioners in the Provisional Orders relating to the undertakings, which require the undertakers to fix annually the charges to be made for the supply of electricity in the then ensuing year at such rates not exceeding certain maximum rates, so that, as far as reasonable, the revenue of that year should not be less than the expenditure of that year." This was precisely what had been done in this case. Then the petitioners urged "that the granting to such Borough Councils of power to wire the premises of consumers and prospective consumers at the cost of the rates would be contrary to the spirit and intention of the said enactments." What these statements of the petitioners amounted to was a contention that no burden should be thrown on the rates. To that his clients agreed; and the proviso gave effect to the agreement. The petition raised all the points of concern to gas companies.

Mr. *Henry Mills*, the Chairman of the Lighting Committee of the Islington Borough Council, examined by Mr. Lushington, said in 1902 his Council, with sixteen others, approached the County Council with a view to obtaining the powers now sought. These powers were included in the Bill of 1902, but were struck out at the Committee stage. In 1903, the clauses were included in another Bill of the County Council, but were struck out on an instruction. Woolwich and Marylebone since then had obtained these powers; and in the past few years about fifty county corporations also had secured them. Sixteen metropolitan boroughs were supplying electrical energy; and all with three exceptions were the sole authorities for the supply of electricity within their areas.

Cross-examined by Mr. Balfour Browne: He believed the granting of these powers to Marylebone and Woolwich was not opposed. The advantage of the clause was that the consumer would escape the initial outlay involved in installing electricity. He did not see that the only way the Councils would induce persons to become consumers of their electricity was by charging the rates with the cost of supplying fittings, &c.

The Chairman: The proviso would prevent that.

Mr. Balfour Browne: I think you will see when I come to deal with it that it does not prevent that.

In cross-examination by Mr. Neville, for the Wandsworth and Putney Gas Company, witness said he accepted the suggestion that in London £382,000 a year was paid by the gas companies for rates, which was equivalent to a price of 3¼d. per 1000 cubic feet of gas. Though the gas companies could not vote directly, their shareholders could.

Mr. Neville: It comes to this, that your competitor and rival is the largest ratepayer, and he is the one person, or one of the chief persons, who has no voice whatever in deciding whether the rates should be applied for the purposes of electric lighting?

Witness: That is a general question.

In further cross-examination, witness denied that there was any question of wriggling out of the Borough Funds Act by using the London County Council as their agent to promote this Bill, and thus avoiding the necessity of obtaining the approval of the ratepayers in regard to it.

The Chairman suggested that it might be useful if Counsel would show how the ratepayers would be damaged by the course proposed.

Mr. Neville said under the original Bill if any deficiency arose from putting electric fittings into a house it would clearly fall on the rates; but the proviso put in that morning to some extent met this, though not sufficiently. The proviso was an attempt to bring the supply of fittings within the Northumberland, Bermondsey, or Marylebone clause; but it did not go far enough.

Mr. *A. B. Bryceson*, the Town Clerk of the Borough of Woolwich, said that in 1903 his Council promoted a Bill, which became law, by clause 3 of which similar provision was made to that contained in clause 63 of the present Bill. The Council formulated a scheme for letting out motors, lamps, and fittings, on hire and the hire-purchase system. The Council had also wired premises for consumers, who paid cash and preferred to have the work done by the Council.

Cross-examined by Mr. Neville: Tradespeople and residents were the class, generally speaking, who took electricity in the Woolwich area. They did not wire the premises of any consumer having a less

interest than a seven years' lease, without a guarantee of the landlord. In Woolwich, nothing had been charged on the rates.

By the CHAIRMAN: If a small manufacturer applied to the Council for a dynamo or motor costing some hundreds of pounds, they would favourably entertain the proposal. The motors in a place like Woolwich did not go beyond £60 or £70. They had 37 motors at present out.

Mr. *Prescott*, the Town Clerk of Fulham, also gave evidence in support of the proposed clauses.

Mr. *S. Hawes* (of Messrs. Robert Hammond and Son), examined by Lord R. CECIL, said his firm were Consulting Engineers to the Borough Council of Hackney. In the borough the absence of these clauses had caused difficulty. In Bradford and Bolton the motor-hiring scheme had most beneficial results on the electric lighting undertaking.

Witness having been cross-examined by Mr. HUTCHINSON, the case for the promoters closed.

The CHAIRMAN remarked that the fact that the proposal had not been before the ratepayers, quite apart from the opposition represented there that day, would justify the Committee in seeing that a really operative clause should be inserted protecting the ratepayers against any loss that might arise. The position was a peculiar one.

Lord R. CECIL agreed. The clause only gave an enabling power; it did not compel the Borough Councils to adopt any of the clauses, or to take action under them.

The CHAIRMAN said several members of the Committee had struck out of the proviso the words "so far as reasonably practicable." There ought to be an absolute insurance against loss.

Mr. FREEMAN said these words were put in to conform with a decision of the Duke of Northumberland's Committee on a similar matter; but he did not think there would be difficulty in modifying them.

Mr. BALFOUR BROWNE: With your permission, I propose to make some observations on behalf of the three London Gas Companies, and of the Electric Lighting Companies.

The CHAIRMAN: The Committee have laid it down that, whatever the decision may be, if any powers are granted, they will expect this proviso to be made absolute—for instance, by taking out the words "so far as reasonably practicable" so that it shall be an absolute security against ratepayers being saddled with any expenses or losses under this heading.

Mr. BALFOUR BROWNE: May I point out that it must not be expenditure only, but that it must cover interest and sinking fund?

The CHAIRMAN: I have repeated all that.

Mr. BALFOUR BROWNE: If I understand it aright, it is no use my addressing you on the preamble, because, if the clause is guarded in the way you say, I am protected; and it is in your intention to protect the ratepayers on my petition. Therefore, it is far more important for my learned friends and ourselves to confer as to the clause that will carry out your decision, than that I should weary you by going over general principles.

The CHAIRMAN: That was our impression.

In the course of discussion with Mr. NEVILLE, the CHAIRMAN agreed that on the demand notes there should be separate lines for energy and for apparatus, and that the two should be kept separate also in the accounts of the Councils.

The Committee then proceeded to hear evidence on petitions other than those of the gas companies relating to this part of the Bill; but they decided to give the clause substantially agreed upon.

THE AMENDED CLAUSES.

On following day,

Mr. FREEMAN announced that clauses to carry out the decision of the Committee had been agreed. The words in clause 63 "whether "directly or otherwise" would be struck out, and at the end there would be the proviso: "Provided also that every such Council shall so adjust the charges to be made by them as aforesaid as to meet any expenditure by them under the powers of this section (including interest upon any moneys borrowed under, and for the purposes of, this part of this Act, and payments to sinking fund in respect of such moneys.)" Clause 63A would read:

(1) Every sum charged by any such Council to a consumer in respect of the wiring and fitting of the premises of such consumer, and the supplying of wires, fittings, motors, and apparatus shall be clearly stated on every demand note by such Council for payment for electrical energy supplied to such consumer distinct from the charge for such energy. (2) The total sums received and expended by any such Council under this part of this Act in each year (including the amount required for interest on and payments to the sinking fund in respect of any moneys borrowed) shall be separately shown in the published accounts of the electric lighting undertaking of such Council for such year.

Mr. NEVILLE: We agree to that.

The CHAIRMAN: That is satisfactory.

The Committee then passed to the consideration of other portions of the Bill.

CROYDON CORPORATION BILL.

A Clause Dealing with Spent Gas Lime.

A Committee of the House of Lords presided over by Lord NEWTON had before them last Friday an omnibus Bill promoted by the Croydon Corporation, in which (Part VII.) was the following clause:

(34) It shall not be lawful to erect a new building, or to form and sewer a new street, on any ground which has been filled up with spent gas lime or other refuse from gas-works, or upon which any such matter has been deposited, until such matter shall have been properly removed, by excavation or otherwise, to such a depth as the Surveyor may prescribe, or shall have been rendered or have become innocuous. Any person offending against the provisions of this section shall be liable to a penalty not exceeding five pounds, and to a daily penalty not exceeding forty shillings.

The preamble of the Bill was proved.

SUPPLY OF ELECTRIC FITTINGS IN DUBLIN SUBURBS.

The Alliance and Dublin Gas Company's Protecting Clause.

In the "JOURNAL" last week (p. 520), we reported the portion of the proceedings on the Rathmines and Rathgar Extension and Improvement Bill, in Sir John Brunner's Committee, in which the Alliance and Dublin Consumers' Gas Company were specially concerned. It may be remembered that certain clauses of the Bill related to electrical matters, and that the Company (who some few weeks ago obtained *locus*) presented a petition in opposition to the Bill. The object was to obtain a protecting clause; and Mr. J. D. Fitzgerald, K.C., on their behalf, suggested the insertion of the one contained in the Leyton Act of last session. The Committee did not trouble the learned Counsel to address them, but expressed their intention of inserting a clause which they considered would be fair, and which would apply to the whole area of the District Council. On Monday last week, an agreed clause was brought up, to carry out the decision of the Committee. It was in the form of the Leyton clause, except as to the free-wiring section, which, as the promoters debarred themselves from employing their own workmen on the premises of consumers, was unnecessary, and therefore was not pressed for.

UNOPPOSED BILLS.

Last week, Lord ONSLOW, the Lord Chairman of Committees, had before him several unopposed Bills relating to lighting.

Otley Gas and Improvement.

The Otley Gas and Improvement Bill has for its objects the giving of power to the Otley Urban District Council to supply gas, to provide for the transfer of the undertaking of the Otley Gas Company to the Council, and various matters of local interest. The Bill was ordered to be reported, with amendments.

Western Valleys Water and Gas.

By the Western Valleys (Mon.) Water and Gas Bill, it is proposed to give power for the re-arrangement of the capital and borrowing powers of the Water and Gas Company. The Bill was ordered to be reported.

Accrington Gas and Water.

The Accrington District Gas and Water Board Bill was also ordered to be reported.

Great Berkhampstead Gas.

The Great Berkhampstead Gas Bill is a measure for incorporating and conferring further powers upon the Great Berkhampstead Gaslight and Coke Company, and for other purposes. It was ordered to be reported.

Croydon Gas.

It is proposed by the Croydon Gas Bill to provide for the transfer to the Croydon Gas Company of the undertaking of the Caterham and District Gas Company, to extend the limits of supply, and to authorize the Company to raise additional capital. The Bill was ordered to be reported, with amendments.

Shepton Mallet Electricity.

The Shepton Mallet Gas Company (Electric Lighting) Bill was postponed.

North Sussex Gas.

This Bill proposes to incorporate the North Sussex Gas Company, and to enable the Company to supply with gas certain parishes in the county of Sussex. After formal evidence, the Bill was ordered to be reported for third reading, with amendments.

Colne Water.

Among the objects of the Colne Corporation Bill is that of the extension of time for their water-works. Mr. Baker (the Agent) said that one of the amendments was that they should not supply water if it would interfere with the supply given by the Nelson Corporation. The Bill was reported, with amendments.

Aylesbury Gas.

The Aylesbury Gas Bill, the objects of which are to incorporate and confer powers on the Aylesbury Gas Company, was also reported, with amendments.

Morley Corporation.

The various powers of the Morley Corporation Bill include some in relation to their water and electric lighting undertakings. This Bill was reported, with amendments.

Brentwood Gas.

This Bill proposes to incorporate and confer powers on the Brentwood Gas Company. The Bill was reported, with amendments.

South Oxfordshire Water and Gas.

By this Bill it is sought to incorporate and confer powers on the South Oxfordshire Water and Gas Company. The Bill was ordered to be reported, without amendment.

Last Wednesday evening there was a burst of one of the 42-inch mains which convey the Welsh water to Birmingham. The accident occurred at Hagley, near a deep cutting on the Great Western Railway; but fortunately the water was cut off before any serious damage had been done. Owing, however, to the fact that there are duplicate mains, the occurrence did not affect the water supply to the city. This is the first big burst that has taken place in connection with the Welsh scheme.

LEGAL INTELLIGENCE.

SUPREME COURT OF JUDICATURE—COURT OF APPEAL.

(*Before the* MASTER OF THE ROLLS *and Lords Justices* MATHEW *and* COZENS-HARDY.)

Tuesday, May 23.

Anti-Vibration Incandescent Lighting Company, Limited, v. Crossley.

This was an appeal by the defendant from the judgment of Mr. Justice Walton, at Liverpool, given on Dec. 17, 1904; the case having been tried at the Manchester Assizes.*

Mr. FLETCHER MOULTON, K.C., and Dr. ATKINSON (instructed by Mr. J. Mack, agent for Mr. J. Lord, of Burnley) appeared for the appellant; Mr. BOUSFIELD, K.C., and Mr. A. J. WALTER (instructed by Messrs. Patersons, Snow, Bloxam, and Kinder, agents for Messrs. Lupton and Fawcett, of Leeds) represented the respondents.

Mr. MOULTON said the action was brought to restrain infringement of letters patent No. 19,462 of 1894. The case was tried before Mr. Justice Walton at the Manchester Assizes, and resulted in a judgment for the plaintiffs. For many years it had been the custom to have suspended lamps; and in mills and other places, it was the custom to suspend the lamps on spring supports, so as to stop vibration being communicated to the lamps. In 1893-4, the system of lighting by incandescent gas became perfected; and it was rapidly taking the place of all other means of lighting. In 1894, the plaintiff took out a patent, the subject of the present action; and he could only say that in all his experience he had never met with such a patent. The claim was really for the use of a spring support for incandescent gas-lamps in conjunction with a flexible gas-pipe; and he submitted there was absolutely no subject-matter and no invention in the patent. In the present case, the actual springs on which the lamps were hung were the same which had been in use for 28 years in factories for hanging oil-lamps on; and the mere fact that gas had gained the day over oil, and that the object in preventing vibration was to avoid the breaking of a mantle, instead of a chimney, did not make it the subject-matter of a patent.

The evidence having been read, which showed that the plaintiffs' springs were more successful than any other method for preventing the breaking of incandescent mantles,

Mr. MOULTON continued his argument on the same line, and submitted that the use of springs to prevent vibration must be open to the public in any way they desired. Having read the judgment, Counsel contended that his Lordship was misled by the idea of a combination; whereas in this case there was no combination in the patent sense.

After a short argument,

The MASTER OF THE ROLLS said he thought they had better hear the other side.

Mr. BOUSFIELD then addressed the Court on behalf of the respondents, and submitted that the learned Judge had taken the right view, that this was a combination of two old matters, the bringing together of which required invention, and therefore formed subject-matter of a patent. He was referring to the authorities on this point when the Court adjourned.

Wednesday, May 24.

Mr. BOUSFIELD continued his argument this morning by further citations from previous cases on the question of anticipation. He pointed out how many other attempts had been made to effect the same object, none of which, according to the evidence, had done so as effectually as the plaintiffs' combination.

Mr. WALTER followed on the same side. He gave an elaborate description of other devices for safeguarding mantles against destruction by vibration, including the mercury bath, the Welsbach burner, and the spiral gas-supply tube. He suggested that the previous use of flexible tubes in connection with gas-lamps had nothing to do with providing against vibration, but was simply to secure mobility. So far from this method of solving the problem being obvious, the patentees had the greatest difficulty in getting it introduced, and only succeeded by putting it in experimentally at their own expense. The learned Counsel proceeded to cite and comment on some of the leading cases dealing with the question of subject-matter.

Mr. MOULTON, in replying, suggested that the learned Counsel for the respondents had very carefully avoided the real point at issue, and went on to point out that the other methods adopted for intercepting vibration were all since the date of this patent, when people were anxious to attain their object without exposing themselves to the danger of a costly law suit. After a good deal of discussion on the point whether at the date of the patent portable incandescent gas-lamps were in use, as to which the evidence seemed rather contradictory, the learned Counsel dealt with the authorities which had been quoted on the other side, and submitted that they did not apply in the present case.

Judgment was reserved.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

(*Before Mr. Justice* JOYCE.)

Third Day—Monday, May 22.

The New Inverted Incandescent Gas-Lamp Company, Limited. v. The Globe Light, Limited.

The hearing of this case was resumed to-day.

Mr. J. F. MOULTON, K.C., and Mr. J. W. GORDON (instructed by Messrs. Steadman, Van Praagh, and Gaylor) appeared for the plaintiffs; Mr. A. J. WALTER and Mr. F. C. SINCLAIR (instructed by Messrs. J. S. Rubinstein and Co.) represented the defendants.

* See "JOURNAL," Vol. LXXXVIII., pp. 710, 987.

EVIDENCE FOR THE PLAINTIFFS' CONTINUED.

Mr. *Brett* was further cross-examined by Mr. WALTER. He said there was no doubt the question of a suitable mantle was of very great importance in an inverted burner. The great object was to have the mantle in the zone of highest temperature. The mantle was very fragile; and one difficulty was its attachment to the burner. If an ordinary mantle were reversed, and the thin edge of the mantle were firmly attached to the metal of the burner, the expansion and contraction of the metal would easily destroy the mantle. This had been overcome by using a ceramic ring. He had no distinct recollection of the Clamond burner. The Welsbach "C" burner always had the interceptor or plate to prevent lighting back. He should be surprised to hear that such a burner would do for an inverted lamp. From his experiments, he should say it would very soon give a luminous flame and deposit carbon. The lighting back of an ordinary bunsen burner was due generally to deficiency in pressure or quantity of the gas supply. The effect of heating an inverted bunsen burner was to lower the velocity of the outflowing mixture of gas and air, and thus tended to produce lighting back.

Re-examined: At the date of the specification, there was no difficulty in fastening a mantle to an inverted burner. It was generally done then with silicate of soda or soluble glass, which, when the mantle was burned off, cemented it to the burner head. This was a very good method, and could be used, he thought advantageously, to attach the mantle to the ceramic ring, instead of tying it with asbestos thread. He considered the deflector absolutely essential to the success of an inverted burner. He had tested it with a pyrometer, and found the temperature of the flame was lowered by from 50° to 100° C. There was no difficulty in determining the proper size of nipple for use with these burners. The best result depended on the quantity of gas passing, which depended mainly on the size of the aperture or apertures in the nipple. The specific gravity of the gas also had an effect. A burner which passed 3½ cubic feet of gas per hour at one time of day, might pass a little more or less at another, according to the proportion of carburetted water sent out from the works.

Mr. *W. H. Y. Webber* said incandescent gas lighting was in general use some years before the date of this patent. He was familiar with the Welsbach "C" burner, including the nipple, which had five small gas-ways. In the plaintiffs' burner, there were three apertures; but the aggregate area was about the same. The practical effect of having three holes instead of five was to give a slight increase of velocity. There was no successful inverted incandescent burner known prior to this patent. In 1900, he visited Germany, and found no inverted burners then in use there.

Cross-examined: A given area divided into five would not pass quite as much gas as the same area divided into three, unless the pressure were slightly increased. For an inverted burner, as for any other, one must have the orifices of the nipple properly proportioned to the quantity of gas intended to be passed through it.

Re-examined: He did not attach any importance to the portion of the drawing in plaintiffs' specification showing the gas inlet. The aperture was obviously too large to be meant to show the exact size.

This concluded plaintiffs' evidence.

Justice JOYCE said he should want to know exactly what the invention was, and what was the infringement alleged.

Mr. GORDON said, in commenting on the evidence, he would deal with these two points. They must start with the common knowledge of the time—an upright bunsen burner specialized to serve the purpose for which it was devised. It was to burn inside a chimney, protected from outside currents of air, and so adapted as to cause the hottest zone of flame to surround the mantle. The first attempt was to invert such a mantle as was in general use at the time, though a much better form was afterwards devised. The first difficulty was to get rid of the glass chimney; one of the earlier inventors, Beese, having tried to achieve the object while retaining the chimney. Directly the chimney was removed, one had to face the difficulty of the contrary air-currents; the flame flowing downwards, and the air-currents set up by the heats flowing upwards, and tending to carry the flame upwards also. On the other hand, the contrary currents had the advantage that they tended to confine the flame to the surface of the mantles. The first device adopted was what was called the isolator—a tube preferably of refractory material, removing the flame some distance from the actual burner, so as to avoid heating the mixing chamber. Even if not made of refractory material, the length of the tube performed the same purpose, just as the length of a saucepan handle prevented the heat of the saucepan being unpleasantly great. The next thing was to prevent the mixing-chamber becoming heated by convection currents; and this was effected by means of the deflector. He submitted that both the isolator and the deflector were sufficiently described in the specification. The nipple, about which so much had been said in the course of the cross-examination, was no part of the invention. It was not claimed; and therefore no specific directions were given with regard to it. The learned Counsel then went on to deal with the criticism on the words "striking back."

Justice JOYCE thought it an unfortunate expression. What he fancied was meant was the lapping back of the flame; but Mr. Walter might persuade him to the contrary.

Mr. GORDON said he would leave the point to be dealt with in reply, if anything was made of it. He did not think in any case it was very material. Counsel then turned to the question of novelty, and submitted that this point was established in plaintiffs' favour by all the alleged anticipations. They were all, with the exception of Kent, of the regenerative type; while this invention was just the opposite—to keep the air and gas supply cool. In Kent's burner, the bunsen burner was erect, though the mantle was inverted. There was no deflector there, because it was not wanted, and would be of no use. In Kent's second patent, the regenerative principle was employed. The only remaining question was that of infringement; and he gathered that the defendants' case was that theirs was a regenerative burner, and therefore could not infringe. There were admissions as to burners which had been sold, only one of which, as he understood, was alleged to infringe; but that one, in his submission, had the essential features of the plaintiffs'.

THE CASE FOR THE DEFENDANTS.

After the mid-day adjournment,

Mr. WALTER opened the case for the defendants. He said, in the first place, the defendants did not infringe the patent; secondly, if the patent, properly construed, covered what the defendants did, he should say it was invalid; and thirdly, the defendants had borrowed nothing from the plaintiffs' specification, but depended entirely on common knowledge. He submitted that the whole object of the patent was to produce an improved inverted bunsen burner, which should not become heated when in use. When he first approached this case, he was puzzled to see how the defendants had taken the plaintiffs' combination; and he was still in the same difficulty after hearing the evidence. The plaintiffs' burner was a non-regenerative one; the defendants' a regenerative one, in which every care was taken to utilize the heat from the products of combustion to heat the incoming gas and air. It was said that the long, thin tube in defendants' burner was, in effect, an isolator; but the thinness of the tube, though it made it a bad conductor of heat from one end to the other, made it more effective in heating the gases within it, which was the point in question here. The tube was no longer than the plaintiffs'. The same with the deflector. Its purpose in the plaintiffs' burner was to keep the hot air away from the burner; but in the defendants', the hot air was allowed to bathe the sides of the burner, and was simply deflected from the air holes, so that pure air only should enter the burner. He did not want to attach the plaintiffs' patent, if it were confined within its proper limits; but if it were sought to extend to something never intended or described, he should submit it was hopelessly bad. A series of tests had been made, and would be proved in evidence, which showed how effectively the incoming gases were heated in defendants' burner, and that the plaintiffs' burner, when stripped of the deflector, also worked very satisfactorily.

Mr. *James Swinburne* was the first witness called. What he found in the patent was what the inventor called an isolator in combination with a deflector. The isolator, if made of metal, was a feature of an ordinary bunsen burner. His object was to keep the incoming gas and air cool. In the defendants' "B.V.L.^{12}," this was not sought or effected; there was no isolator. The internal gas would get the hotter the thinner the tube; and the spherical chamber at the top also got heated by the products of combustion. In "V.B.L.^{2}," which was a specification of the burner complained of, the same features were observable. In this, the so-called deflector was so shaped as to retain the products of combustion, and there was a small aperture which led them up to the top chamber, which they heated up. The regenerative action would be more marked in this one than in the other. There was no device whatever for keeping the incoming gas and air cool. Coned gas and air mixing-chambers were well known in connection with bunsen burners at the date of the patent. It was also well known to make provision in regenerative bunsen burners to prevent the products of combustion entering the mixing-chamber. This was shown, for instance, in Clamond's burner of 1891 (when that was a partially inverted bunsen), in Kent's, and in Henze's. He had experimented with a model made according to Henze. The air inlets were protected from the flame by a deflector. A mantle could be hung on it, and a good light produced. In Beese's burner, the entering air was protected from the flame and from the products of combustion. The bunsen burner part of the lamp was quite effective, and burned well. The "C" burner was very familiar. The function of the small plate at the base was to prevent the flame from above getting to the air holes and igniting the gas-jet. Ordinary mantles were unsuitable for inverted burners. The efficiency of the latter depended very greatly on the shape and adaptation of the mantle to the flame; it should just fit the flame, as it was modified in shape by the mantle.

Cross-examined: The interceptor plate in the "C" burner had no function except at the moment of lighting. In the regenerative lamps which preceded plaintiffs', there was in most instances a forced draught. This necessitated the air coming in through pipes from outside; and such air was heated. He first saw plaintiffs' lamp about six months before he heard of any litigation—about 1903. The object was to get an inverted bunsen burner suitable for use at ordinary gas pressures. He succeeded, subject to the question of the nipple. The size of the nipple depended on the amount of gas one wanted to introduce. There must be the right quantity and the right velocity, which was always a matter of local adjustment. The effect of the deflector was to turn away the products of combustion from the mixing-chamber, and so keep it cool, and likewise keep the air supply quite pure. Allowing them to impinge on the chamber would tend to dilute the air supply and reduce the temperature, and so might produce pulsation in the flame, which would be deleterious. In defendant's lamp "V.B.L.^{2}," and in the plaintiffs' lamp, the tube was much longer than in the "C" burner, which burned upright. In an inverted burner, the tube must be longer, unless some other means were devised to keep the air holes free from flame and products of combustion. Lengthening the tube was one way, but not the best. With regard to what was called the deflector in the defendants' lamp, he considered the presence of the nickel plate would make the tube hotter than it would be without. He did not know what the object of the internal arrangement in the globe at the top of the defendants' lamp was; but he thought the globe itself was put there for the purpose of holding the arrangement. Its effect was to protect the air holes to a certain extent.

Tuesday, May 23.

Mr. *Swinburne*, in further cross-examination, said he agreed that the nickel plate in defendants' lamp to some extent protected the bulb above it from heat; but it tended to increase the heat in the tube.

Re-examined: There was no standard of length for the tube of a bunsen burner. It must be long enough for the gas and air to mix properly; but subject to this, it was made as short as convenience dictated. The forced draught which was said to be present in most of the alleged anticipations was simply produced by the chimney.

Mr. *G. C. Marks*, Patent Agent, said he had made many experiments with the burners in question in this case. He described the experiments he made with four of defendants' burners which had been produced. V.B.L.^{12}, V.B.L.^{2}, and V.B.L.^{13} were the forms in use on the market. V.B.L.^{12} was the same as one of the others, but with the gallery removed. He did not find in any one of them the combination claimed by the plaintiffs. In V.B.L.^{12} (one without the nickel plate), the bulb speedily became discoloured; but when the nickel plate was added, this was to a great extent remedied. He had prepared a table showing the results obtained with various burners. The first was one of plaintiffs', which he kept burning for four hours' continuously. The pressure was $2\frac{1}{2}$ inches, and the candle power 36. At the end of the time, the top of the china deflector was not too hot to bear the hand upon. Six other experiments were made with defendants' burners, with and without the nickel plate which the plaintiffs said was a deflector; and in every instance the globe at the top was too hot to touch. In one case, this happened after burning only half-an-hour; in another, after $2\frac{3}{4}$ hours witness blistered his finger by touching it; and after $14\frac{1}{2}$ hours, moisture was immediately converted into steam. The candle powers were all rather above that of plaintiffs—varying with the gas pressure, which was also slightly greater. The candle powers were not absolute, but were all taken in the same way—*i. e.*, horizontally. The burner without the nickel plate gave the same light as the other one; and he saw no pulsation. He then described a number of experiments he had made during the previous night at a photographic studio with an ordinary "C" burner, and produced photographs of some of the results; but there had not been time to develop them all. He inverted the burner, fastening it with wire so that the gallery should not fall off, and it burned for 13 hours with the flame at the nozzle, and did not light-back. He then attached an ordinary mantle, and it still burned properly, and did not light-back, the mantle being partly incandescent. He next described the ordinary bunsen burner referred to in the former evidence, which he purchased at Baird and Tatlock's. It would not burn properly when reversed; but on making the nipple smaller, it would. He then fitted a mantle-holder to it; and with a suitably-shaped basket mantle it burned for six days continuously and satisfactorily. He examined it from time to time, and never saw any pulsation. He had also constructed a burner according to the specification, but without the deflector and the cup; and it acted apparently just the same as an ordinary one. He had found that it was not at all necessary to have the mouth of the burner inside the mantle; his experiments were made with the mantle about $\frac{1}{16}$ inch below the mouth of the tube. With regard to the globe at the top of defendants' burner, the internal arrangement which had been referred to was, as he understood, simply a set of baffle-plates to keep the air supply regular in case of exterior draught. Such baffle-plates were very common.

Cross-examined: The inverted burners now in use for lighting had no chimney; they all had a tube between the mixing chamber and the mouth of the burner much longer than in the "C" burner. In one form of the defendants' arrangement, the whole upper part was nickelled. This was the most expensive kind. He had no doubt the nickel plate deflected the products of combustion outwards, because the plate was cooler than the globe at the top, which was heated directly by the tube. In his experience, the light in defendants' lamp did not fluctuate, even without the nickel plate. In the photograph showing a mantle with a reversed "C" burner, only about one-third of the mantle was incandescent. The photograph of the flame (without the mantle) from the inverted "C" burner was taken by reflected light from the studio. With five minutes' exposure, there was not enough light in the flame itself to produce a photograph. It was a bunsen flame, and would have incandesced a mantle. The Baird and Tatlock burners were intended for heating purposes, and passed a large quantity of gas. The nipple had to be reduced to make them burn in an inverted position. He did not see why such a burner should not be used in future. The reason it had never been employed hitherto was probably because suitable mantles were not available. It would not be feasible with an ordinary mantle. When he experimented with a burner made according to the specification, but without the deflector, he made no photometric observations.

Re-examined: The experiments with defendants' burners, with and without the nickel plate, showed the same candle power with the same combustion of gas. The flame which was photographed the previous night was a blue flame, and would have caused incandescence in a mantle.

This concluded the evidence for the defendants.

Mr. *Brett* was re-called, and said he had tested the defendants' burners with and without the deflector-plate, and found in the latter case the flame was inferior. It was cooler, and pulsated more. He tested it with a thermo-couple of platinum and rhodium.

COUNSEL'S SPEECHES.

Mr. WALTER then summed up for the defendants. He pointed out that the essential parts of the plaintiffs' combination were the isolator and the deflecting cone, and nothing which did not contain these two features could be an infringement. He also said that neither of these elements could be found in the defendants' burner. The evidence of Mr. Marks was conclusive that the globe at the top was not kept cool. There was no isolator; and in the sense in which the plaintiffs used it there was no deflector.

Mr. MOULTON, in reply, said it was quite plain now that this invention had not been anticipated, and there was no real attack on the validity of the patent. The real question was one of infringement. He proceeded to comment on the evidence, and to submit that there could be no doubt that the nickel plate acted as a deflector, and that in substance there was also an isolator. The case was stronger in respect of one lamp—that on which the action was brought; but even in regard to the other one, in which there was no nickel plate, there was substantially an infringement, the lower hemisphere of the globe acting as a deflector.

THE RESULT.

Justice JOYCE, in giving judgment, said this was a patent for the combination in a reversed bunsen burner of what was called an isolator with what was called a deflecting cone, or conical head on the isolator. He had some doubts about the validity of the patent—at any rate, some things had come out in evidence on which at least an

arguable objection to its validity might be founded. But he need not say more about this, because Mr. Walter had decided not seriously to attack the patent, but to rest his defence on the question of infringement alone. Upon this issue, he had come to the conclusion that Mr. Walter was right, and that there was no infringement at all of this patent by any of the lamps which defendants had put on the market. Defendants had taken the ordinary bunsen burner and reversed it. There had been some adjustment apparently of the size of the nipple to the aperture where the gas issued; and there was an open nozzle or burner-head at the lower end of the common metal tube. In the defendants' lamp, the burner-head was not in any way separated from the bunsen body, but remained connected with it by the metal tube. Nor did he think that this tube was unduly prolonged, if that were material. If anything, it seemed, on comparison with the plaintiffs', to be a little shorter. It appeared to him that the plaintiffs claimed a separate thing, composed of a bad heat-conducting material intervening between the bunsen body and the burner-head, which was to be of metal. He could not find in the alleged infringement any such isolator as described or referred to in the specification, or any isolator at all. If he were right in this, there was an end of the case, because that was an essential element of the combination; but the plaintiffs claimed also as part of the combination a deflecting cone attached to the isolator. The defendants had no deflecting cone on the isolator, because they had no isolator—nor, in fact, had they any cone at all. In some lamps, they had a horizontal circular metal plate, through the centre of which the tube between the bunsen body and the burner-head passed. He thought it was not put there for the same purpose as the deflecting cone. He was somewhat in doubt whether it might not partially have the same effect as the deflecting cone was said to have; but he did not think it was put there for this purpose, and, if it were, that would not make it an infringement unless there was an isolator also. The result was that, in his opinion, the defendants had not stolen or borrowed anything from the plaintiffs' specification; and therefore the action must be dismissed, with the usual consequences as to costs.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

(*Before Mr. Justice* WARRINGTON.)

Fourth Day—Wednesday, May 24.

Plaissetty Mantle Syndicate v. Welsbach Incandescent Gas-Light Company, Limited.

Mr. TERRELL, K.C., and Mr. SOPER (instructed by Mr. Eugene H. Goddard) appeared for the plaintiffs; Mr. ASTBURY, K.C., Mr. NORTON, K.C., and Mr. WALTER (instructed by Messrs. Michael Abrahams, Sons, and Co.) represented the defendants.

EVIDENCE FOR THE PLAINTIFFS CONTINUED.

On the resumption of the proceedings to-day,

Mr. *Terrill*, in further cross-examination by Mr. ASTBURY, said he had no doubt when he went to see Mr. MacKean about the mantles he told him (MacKean) what he used in the manufacture. He did not remember the details; but he knew there was a good deal of discussion between himself and Mr. MacKean, because they did not agree as to details. MacKean held that impregnation of the cellulose should be done after knitting; and witness held the contrary. He told MacKean he was using a solution of 2 to 1, but could not agree that a solution of 1 to 1 was sufficient. The mantle could be made with less solution; but then it would require double impregnation. He did not acquiesce as to the way the defendant Company made his mantle. He wrote to them about the use of bleached instead of mercerized cotton.

Mr. ASTBURY: Before the second agreement, did you know that it was proposed to use bleached cotton?

Witness: I do not think I did.

Mr. MacKean is going to say he showed you his process of manufacture, explained to you that it was much better than yours, and that you absolutely concurred with him?—I should disagree with that. There was every reason why I should not have done so. At that time MacKean was looking at the thing from the point of view of facility of manufacture; but I was looking at it from the point of view of the excellence of the article when manufactured. These were the two governing principles that set us apart.

In reply to further questions, witness said it was in accordance with the arrangement that defendants called the Plaissetty mantle the "improved" Welsbach. Mr. Williamson was extremely anxious that he should reduce his royalty to a farthing; but witness always refused. It was in his mind that the Welsbach Company should put their whole make on the Plaissetty mantle; but he certainly did not recollect Mr. Mattinson saying that if this was witness's idea he would not consider it for a moment. Nor did he remember Mr. Mattinson saying they had large contracts for "CX" mantles, and that they could not go on with the Plaissetty mantle only. MacKean said he could not make the mantles so cheaply by plaintiffs' method as by the way defendant Company adopted. When he visited the Welsbach factory, he was afforded every information, and was refused nothing. He did not remember Mr. Mattinson telling him that he could not hope to sell anything like 3 million mantles as a minimum. There was a great deal of complaint on the part of the plaintiffs that the defendant Company had not sufficiently pushed the Plaissetty mantle. He admitted that the defendants had had a great deal of trouble with spurious mantles imported into the country at rubbish prices. In his opinion, the attitude of the Welsbach Company all along was that they would put the plaintiffs' mantles on the market alongside their own, but would not say anything as to whether it was better or worse than theirs. In January, a suggestion was made by plaintiffs that they were going to issue broadcast Mr. Ballantyne's report on the Plaissetty mantle. This was mentioned to Mr. Fletcher, the Manager of the Welsbach Company; and he said he should consider it an unfriendly act.

Mr. ASTBURY: Do you know that Mr. Plaissetty had written to the plaintiff Company and said that Mr. Ballantyne's report was incorrect?

Witness: I think it is very likely. Mr. Plaissetty had got very cross because we were taking up the cotton mantle at all.

You made an inquiry whether the Welsbach Company would object to the publication of the Ballantyne report, and they agreed?—Yes, eventually, with the proviso that the advertisement should make it clear it was our advertisement and report and not the Welsbach's.

Witness further said that at this period—about January, 1904—the plaintiffs were employing agents to go about London, and find out what the defendants were doing to push the Plaissetty mantle, and when they found out they were not doing what they thought was necessary, the plaintiffs gave notice to the Welsbach Company that they should themselves advertise it.

Mr. ASTBURY: You know that the policy of the Welsbach Company has been in the past not to "puff" any particular mantles, though they have a large number of them?

Witness: I think you must be mistaken, I know they have said the Welsbach mantle is the best in the world.

In further cross-examination, witness said when he complained of the defendants' travellers not pushing his mantle, he was shown a number of orders for Plaissetty mantles which one of defendants' travellers had taken. This surprised witness; but he was nevertheless not satisfied with what had been done, nor did he ever say he was. He waited till the end of the agreement with the Welsbach Company before taking legal action.

Mr. ASTBURY: Do you think it fair to do what you did—to let the defendant Company think for twelve months you were satisfied with what they did, and then, at the end of the period, sue them for doing what they said they would do?

Witness: I went there and told them what I considered they ought to do. Each side put its own construction on the agreement; and after that we made no further representations. When we advertised and sent out a circular, a large business resulted.

The case was adjourned.

Fifth Day—Thursday, May 25.

At the sitting of the Court this morning,

Mr. TERRELL stated that since yesterday negotiations had been entered into with a view of settling a fresh agreement altogether and putting the matter on a new basis. To facilitate these arrangements, it had been agreed that the action should be abandoned; and it would accordingly be dismissed with costs.

Justice WARRINGTON said he was quite sure the parties had adopted a sensible course.

HIGH COURT OF JUSTICE—KING'S BENCH DIVISION.

(*Before Mr. Justice* WILLS *and a Special Jury.*)

Thursday, May 25.

Mason and Others v. Commercial Gas Company.

This was an action brought by James Mason, an omnibus driver, and his wife, Alice Mason, to recover damages for personal injuries to Mrs. Mason and her daughter, and injury to property, from an explosion of gas on Sunday, July 10, 1904.

Mr. POWELL, K.C., and Mr. DRAKE (instructed by Messrs. Dyson, Smith, and Marchant) appeared for the plaintiffs; Mr. ELDON BANKES and Mr. G. WALLACE (instructed by Messrs. Hollams, Sons, and Coward) represented the defendants.

Mr. POWELL said the explosion took place when the female plaintiff was cooking at a gas-stove supplied on hire by the defendant Company, who did all the fitting; and it was alleged that the accident occurred through improper materials being used, or negligence in the mode in which they were fitted.

Mrs. *Alice Mason* said she resided at 108, High Street, Bromley-by-Bow. In 1901, she applied to the Commercial Gas Company to have the gas laid on; and this was done in November, 1902, on the penny-in-the-slot system. In the following month, a cooking-stove was fitted in the kitchen, similar to one which was produced in Court. The meter was about 6 feet from the floor; and a pipe ran from it to the stove. There was some trouble at first with the meter; and a fresh one was fitted in November, 1903. There was a little ring-stove which stood on the hob, to which the gas was supplied by an india-rubber tube; and when there was a complaint made about a smell of gas, one of the Company's men who came said it was due to this rubber tube, and put on a fresh one. The smell then ceased until May, 1904, when it was again apparent, and she wrote to the Company. Witness could not remember the exact date. No one came in answer. Later on, she sent a post-card. She could not give the date; one was on the 9th of July. A post-card of that date was produced, which she said looked like her writing, but she did not remember it. She knew an employee of the Company named Stock, who laid on the gas. She saw him in the street, before she sent the post-card, and asked him to come and look to the gas; but he said he was busy, and told her to write. She also complained of the smell to the collector, who called every month, and to the meter inspector. On Sunday, July 10, about ten o'clock, she heard a kind of whistling noise. Immediately afterwards there was a loud explosion, and she fell backwards, and her daughter Lily was thrown against the sofa. At that time the ring at the back of the top of the stove only was lit. The windows and doors of the kitchen were wide open. She was unconscious for some time, and some neighbours came in. Soon after the explosion, someone came from the Company—Stock and another man. They took down the meter and removed it, but left the stove, which was uninjured. Later on in the evening, two gentlemen came, and inquired what had happened. They said the taps of the stove must have been on. She said they were not—only one ring was turned on. The stove had remained ever since. On the Monday, two men came. She was lying on the sofa, and did not see what they did. She was confined to bed for a period of eight weeks, and was attended

by Dr. Alexander. Up to then her sight had been very good; but ever since she had had to wear glasses. She had to get a woman to do the housework for some time at 12s. a week.

Cross-examined: After the explosion, the wall-paper at the back of the stove showed signs of injury, and all along that side. When she heard the hissing sound, she thought it was a motor-car in the street. She was always careful not to use more gas than necessary. The main-tap to the stove was only partially turned on, as she was only using the small ring. After the explosion, she turned the gas off at the meter. When the men came in the afternoon, they did not turn it on again and find that the gas was on in the stove. They took down the meter. She denied positively that they said the gas was passing through the stove. They said the trouble lay with the piece of pipe which they took down. There was a faint smell of gas in May, which gradually got worse up to the time of the accident. She posted the card on the 9th, after speaking to Stock in the morning. (The post-card bore the mark 7 p m.)

Re-examined: She very seldom used the oven—not more than three times since she had the stove. A great deal of crockery was broken by the explosion.

Lily Mason, the daughter, was next called, and gave corroborative evidence. She did not touch any of the taps or the stove at all. The explosion threw her on the sofa, and hurt her cheek. A fortnight afterwards she brought up a quantity of blood. When the men came the first time, they removed a piece of the pipe, and took it away.

In cross-examination, witness said she saw a split in the piece of pipe which was taken down. One of the men blew through it. She did not hear Stock tell her mother that the explosion must have taken place in the stove.

Dr. *Samuel Alexander* gave evidence as to the injuries of Mrs. Mason and her daughter. His fees amounted to £10 10s.

James Mason, the plaintiff, said he remembered the gas smelling very badly in May; and, by his directions, his wife wrote a letter to the Gas Company, which he himself posted. He was away from home the whole of the day the accident happened. He was present on the Monday morning when the men came to re-connect the stove. They had to send for a piece of pipe to connect the meter to the main.

Mr. *Arthur Watson* spoke to examining the gas-fittings in plaintiffs' house in October last. There was a new piece of pipe leading from the main to the meter. With this exception, the fittings did not appear to have been touched. He afterwards examined at the Solicitors' office a piece of pipe said to have been the one removed; but he did not believe it was the one because he was quite certain it would not fit properly in the space from which it was said to have been removed, and it had no smell or taste of gas, and the union at one end was different to the one now fixed. It was a better made joint than the one substituted for it. He was quite certain the explosion did not take place inside the stove, or some traces of it would have been visible, either in the stove itself, or in the supply-pipe.

Cross-examined: It was early in April that he saw the pipe at the Solicitors' office. He suggested that one of the Company's workmen had substituted the pipe, to get himself out of trouble. The pipe had been used for gas. It smelt very slightly—not so strongly as it would if it had been recently removed. His chief reason for thinking it was not the original one was that there would have been no reason whatever to remove it. Two written reports by the witness were read; and he was cross-examined upon them. He had never heard it suggested that there was a split in the pipe which was removed.

Re-examined: He did not think any of the other Metropolitan Gas Companies used compo. pipe in connection with prepayment meters.

Mr. *W. Stanton* spoke to going with the last witness to examine the piece of pipe at the Solicitors' office, and also to visiting plaintiffs' premises. He agreed with the last witness, and pointed out that the union joint on the end of the piece of pipe was unsoiled, and had apparently never been in use.

Cross-examined: He did not suggest that one piece had been purposely substituted for another; the original one might have been lost. If there was no defect in the supply-pipe, the explosion must have taken place in the stove.

Friday, May 26.

This morning, the first witness called for the plaintiff was Mrs. *Enever*, a neighbour, who said that about three weeks before the explosion she had, on visiting Mrs. Mason, sometimes detected a smell of gas. Miss *Kate Larkin* gave similar evidence, admitting in cross-examination that the smell was worse sometimes than at others. Miss *Rose Hubell* gave evidence to the same effect, and said that the odour of gas was more perceptible in the kitchen. The next witness was Mrs. *Bird*, a neighbour, who said she heard the explosion very plainly, and the force of it shook the glass in the windows of her house, which were open. The witness further said she did not know Stock by sight, but on the day before the explosion she heard Mrs. Mason talking to a servant of the Company, and asking him whether he would come and attend to the gas in her house. He replied that he could not do so, as it was not his work, and she must send to the Company. On being cross-examined, she said Mrs. Mason was half-way between No. 114 and witness's own gate.

This concluded the evidence for the plaintiffs.

Mr. Eldon Bankes, in opening the case for the Company, said it had been established that the explosion could only have happened in one of two ways—either by the gas being allowed to escape into the oven, or else by the pipe which was in connection with the meter being defective. The witnesses whom he would call would prove that it did not arise from the latter cause.

The first witness for the defendants was *Stephen Stock*, who said he had been in the Company's service for four years, and his duties were to lay service-pipes. He had never at any time had anything to do with putting up meters or stoves, or making any of the connections. He did not see Mrs. Mason on the Saturday before the explosion; he was working at No. 114 with his mate Williamson, but was not there all the time, as he was called away about 11 o'clock by the foreman Harrison to attend to another escape at 135, Bow Road, which occupied about an hour. When he went back to No. 114, he had instructions to go and do a syphon-box in Addison Road; and thereupon he cleared up the job at No. 114, and did not return there that day. On the Sunday a little boy informed him of the explosion, and he arrived at Mrs. Mason's house about half-past one, in company with Harrison, and went into the kitchen, where they saw Mrs. Mason and also Mrs. Lee. The former seemed very much upset. He asked her what had happened. She said there had been an explosion; and he asked her if she knew how it occurred. She said she did not. She informed him she had turned off the gas immediately after the explosion, and he found that the gas had been shut off at the main-cock. Witness and Harrison set to work to trace the escape, and turned the main-cock on again. They watched the index of the meter, traced the escape to the stove, and found the tap from the meter leading to it turned three-parts on; those leading to the oven and the boiling-ring being full on. They turned the taps off, and watched the index again, and it never moved. While the gas was on they tried every joint on the meter side and the other side of the stove with a light, and smelt all round, but found no escape there or upstairs. They then told Mrs. Mason that everything was right; but she was not satisfied with this, and said she would have the thing taken away. Harrison then took off the inlet-pipe, and capped the supply-pipe. The only mark of the explosion he found was on the wall behind the inlet of the stove; all the paper being torn away, and some of the plaster work as well. On being asked by Counsel whether he had any conversation with Mrs. Mason, he said he told her he thought she had been using the stove, and she said she had not. He did not see the daughter there the first time he went. When he left he took the connection (which he identified as the one produced) home with him, and kept it until the following Monday morning, when he handed it to Mr. Sterriker, the defendants' inspector. He went again on the Sunday, accompanied by Harrison, to the Masons' house about 8.30 p.m., when the pressure of gas would be greater. He then saw Mrs. Mason's daughter. They began talking about the explosion, and he asked her if anybody had been using the stove. She replied "Yes." He then said: "Why, your mother told me she was not using it." She replied: "That cannot be true; mother was cooking some peas on it." The object of their going was to see if they could detect any smell coming through the wall from the iron pipe when the pressure was on. He went again, still later in the evening, accompanied by Mr. Sterriker, Mr. Smith, and Harrison.

In cross-examination, witness admitted that if there had been a leakage in the pipes on the house side of the supply-pipe there would have been a movement of the index of the meter. After making the test they did, he came to the conclusion that the escape was in the oven. The only thing they removed was the connecting-pipe, which they took away at Mrs. Mason's request. She asked them to disconnect the meter; the pipe could have been left there. They would have taken the meter as well if it had not been Sunday. Witness was certain that he drew Mrs. Mason's attention to the taps being on. He could swear that he asked her if she had been using the stove, and she said "No." He had seen hundreds of stoves like the one in use, and they were much alike. The gas could be cut off outside from the main.

In answer to a question put by the Jury, witness said Mrs. Mason told him to take the pipe away.

W. T. Harrison stated that he was a service layer in the employ of the Company, and when he went with Stock to the Masons' house, they first went downstairs and saw Mrs. Mason and also Mrs. Lee. Mrs. Mason said there had been an explosion; and Stock asked her if she had been using the stove. She said "No." The gas having been turned off at the main by Mrs. Mason before they arrived, it was turned on again, and he looked at the index of the meter and found it was travelling. He said to Stock "This is where it is," meaning that the hand was going round. Stock looked at the stove and found some of the taps on. After they were turned off, they tried all the joints with a light, and found them all right. He then watched the index for about ten minutes, and it did not move. Witness corroborated the evidence given by Stock.

Mr. *R. B. Sterriker* said he was District Engineer to the Company, and had been in this position for more than thirty years. He went round to the house, as had been stated. Stock brought him the connecting-pipe on the Monday, and he had kept it in his custody ever since until it was handed to the Company's Solicitors. He had tested it with gas under pressure, but it was perfectly tight.

In cross-examination, witness said the only damage he could see to the wall was where the paper was torn away about 8 or 9 inches. The glass of the bookcase was cracked; a shaving-glass was knocked down in the scullery; and he was shown some ornaments which it was said were broken by the force of the explosion. They sometimes had to disconnect the meters in the 30,000 cases in which they supplied gas; but no other connecting-pipe like the one in question had been brought to him during the last six months. Up to the time of it being brought to him, nobody had suggested that either the pipe or the union was defective.

Frederick Danselman, the superintendent of the stove and fittings department of the Company, and also *Stephen J. Mastow*, the assistant superintendent, deposed that instructions were given to have a new pipe fitted to the meter. *Robert Deeley* said that he fitted a new piece of pipe to the meter, and left everything satisfactory. The other witnesses called in support of the defendants' case were *Edward Richardson*, a prepayment meter inspector; *Parkin*, a fitter; and *George Carton*, who said that all complaints in writing were entered in a special book, but that there was no record of the letter having been received which Mrs. Mason stated that she had written. *Albert Allen* and *Robert Williamson* were also called.

Mr. Eldon Bankes having summed up the case on behalf of the defendants, and

Mr. Powell having addressed the Jury in reply,

Justice Wills summed up. He said the special damages, apart from the personal injury to Mrs. Mason and her daughter, were agreed at £25, if the plaintiffs were entitled to recover at all; but the really substantial question was whether the defendants were responsible. In the first place, it must be shown that there was some neglect of duty on their part; and, secondly, that reasonable notice of it was given

them. He then went through the evidence in some detail, and pointed out that the burden of proof lay on the plaintiffs.

The Jury retired; but, after an absence for an hour-and-a-half, they were unable to agree, and were discharged.

HIGH COURT OF JUSTICE—KING'S BENCH DIVISION.

(*Before Mr. Justice* BIGHAM.)

Monday, May 29.

United Gas Improvement Company v. Gordon—The Question as to a Monazite Sand Contract.

His LORDSHIP this morning delivered judgment in the above-named case (see pp. 449, 517); but his decision was only a partial one, and further evidence and argument has still to be adduced. He first gave a brief history of the case, and read the most material portions of the agreement of May 28, 1902, under which the plaintiffs purchased from the defendant his Brazilian concessions with regard to monazite deposits, together with his contracts for supplying monazite sand; the one chiefly in question being that of April 12, 1902, under which he had agreed to supply four German manufacturers of thorium with their "requirements" for a period of five years. He was satisfied that from the first the plaintiff Company disliked this contract, would have been glad to repudiate its obligations, and never, in fact, acknowledged their liability to carry it out, because it to a considerable extent limited that control of the market which it was their object to obtain. Looking to the fact that Mr. Gordon was personally responsible to those German firms, to whom necessarily he would remain liable to supply their wants if plaintiffs gave notice not to complete the purchase of his interests—as, in fact, happened—he considered that he was justified in shipping monazite to Europe for the purpose of fulfilling those German contracts, and not relying, as the plaintiffs said he ought to have done, on the indemnity given him by them against the consequence of any breach, and leaving them to fight out the question with the German firms. On the other hand, if and so far as Mr. Gordon had shipped monazite sand in excess of what was required for such purposes, he thought there had been a breach of the contract, for which the plaintiffs would be entitled to sue; but he was not in possession of any evidence as to what damages they had sustained. In the first place, it was very difficult to say what was the exact meaning of the word "requirements" in the German contract, which left at present unascertained what was the quantity in respect of which damages could be claimed; and, in the second place, there was no evidence whether any of this material had been sold to other parties. It would, therefore, be for the plaintiffs to prove their damages in this respect, if they elected to go on with the case, and the costs would be reserved until this had been done. If, however, they preferred to take the opinion of the Court of Appeal on the judgment he had now given, they could do so, and he would do his best to put the order in proper form.

Considerable discussion ensued, as the result of which Mr. Rufus Isaacs said it would be much more satisfactory to have his Lordship's final judgment before going any further; and the case will come on again with further evidence on the points left open—the plaintiffs to have further discovery from the defendant as to the destination of the various shipments. The case stands over until after Whitsuntide.

HIGH COURT OF JUSTICE—DIVISIONAL COURT.

(*Before the* LORD CHIEF JUSTICE *and Justices* KENNEDY *and* RIDLEY.)

Tuesday, May 23.

Meadows v. Grand Junction Water-Works Company.

This was an appeal by the plaintiff from the Deputy-Judge Fitzroy Cowper, at the Marylebone County Court,* and raised the point whether, when there had been a mutual *bonâ-fide* mistake of fact, money paid in error could be recovered. Under section 4 of the Act of 1856, tenants of houses on the Bishop of London's estate are entitled to have their water supplied at a rate of 15 per cent. less than other houses in the parish. Plaintiff had paid the full rate for many years, not knowing that he was on the estate; and it was agreed that the Company were also not aware of the fact, owing to an error in the map supplied by the Bishop of London's Solicitors not showing the house as being on the estate. When the mistake was discovered, the Company made the rebate, but declined to pay back the six years' overpayment. The case was said to be of some importance; the Company having set aside about £10,000 to meet other claims which might arise. The Deputy-Judge held that he was bound by the cases of *Henderson v. Folkestone Water Company* and *Slater v. Mayor of Burnley*, and decided against the plaintiff.

The LORD CHIEF JUSTICE pointed out that these decisions proceeded upon there being a mistake in law, and not a mistake of fact.

Mr. A. S. POYSER appeared for the appellant; Mr. MACMORRAN, K.C. (with him Mr. SNAGG), represented the respondents.

Mr. MACMORRAN said he did not dispute that money paid under a mistake of fact could be recovered; but here the mistake was due to plaintiff's negligence in not finding out that he was on the estate. The demand notes clearly stated that tenants of such property were entitled to the rebate, and the Company were in no way to blame for the error in the map, which was not discovered until they were about to be taken over by the Water Board.

* See "JOURNAL," Vol. LXXXVIII., p. 854.

Their LORDSHIPS said the case undoubtedly raised an important point; but they were unable to say that this was a voluntary payment which could not be recovered. There had been a clear mistake of fact; no notice having been given that the house was on the Bishop's estate. The Act expressly provided that the Company should supply water at 15 per cent. less to persons on the estate. The cases referred to by the Deputy-Judge, which were founded on the meaning of annual value, had no application to the present case. There had been a clear mistake of fact; and the money must be repaid.

The appeal was allowed, with costs.

HIGH COURT OF JUSTICE—KING'S BENCH DIVISION.

(*Before Mr.* JUSTICE WILLS.)

Thursday, May 25.

Corporation of East Ham v. Ilford Gas Company.

Application was made that this action, which is brought to recover damages from the Gas Company in respect of injury alleged to have been caused by flooding through works which the Company had constructed, might stand over till next sittings. It was stated that the case raised many important issues, and the litigation would be costly to the unhappy ratepayers of East Ham. Plaintiffs asked that the case should stand over, as their Solicitor was ill, and because a similar action had already been tried, which had been taken to the Appeal Court, and was now on its way to the House of Lords. Considerable costs would be saved if this action stood till after the House of Lords had given their decision. The defendants strongly opposed the application, as all the expense had been incurred and the case was ready for trial.

His LORDSHIP ordered that the case should stand over until next sittings, the plaintiffs to pay the costs of the application.

A Gas Manager Fined for Assault.

A case was heard last week by the Caerphilly Magistrates in which Mr. A. R. Cawley, the Manager of the Rhymney and Aber Valleys Gas and Water Company, was summoned for assaulting Mr. John Payne, a commercial traveller, of Caerphilly. The complainant said that on May 9 he was at Gilfach, near Pengam, when he saw defendant in his trap. The latter pulled up, and said: "Do you know who I am?" Complainant replied: "I presume you are the Gas and Water Manager." Defendant said: "What do you intend doing with the water account?" Complainant replied: "I want a correct account." Complainant told Mr. Cawley not to molest him in the street, and with that defendant took his whip and aimed a blow. A second blow struck complainant on the ear and cut it, and defendant then drove away. Defendant entered the witness-box, and gave an emphatic denial to having aimed the blow at complainant. Defendant was fined 40s. and costs, with advocate's fee.

An Unfenced Gas-Engine Flywheel.

At the Wolverhampton Police Court last Wednesday, Messrs. Frank Myatt and Co., Limited, brewers, were summoned for not having the flywheel of a gas-engine securely fenced. Mr. Garvie, Factory Inspector, who supported the summons, submitted that the fencing of the wheel was absolutely essential. The fact that the engine was in a locked-up shed was not sufficient. On the other hand, Mr. Turton, for the defence, contended that the wheel was fenced as far as practicable; and that being so, his clients felt compelled to come forward and contest the case. The wheel was against the wall, and no one could pass by it. It was impossible for an accident to happen, and it was impossible to fence it more. The evidence for the defence bore out Mr. Turton's assertion. It was admitted that there was nothing to prevent a man slipping against the wheel; but an engineer of twenty years' experience said he had not heard of a man, in starting an engine, falling against the wheel as it made its first revolution. It was possible for such an accident to happen; but the man was bound to pull at the wheel to start the engine, and iron fencing to prevent his body coming in contact with the wheel would be of little use. In fact, he thought it would increase the danger. A representative of the firm who made the engine gave it as his opinion that the wheel was fenced as far as practicable. The Magistrate went to see the engine; and on his return, he said there was some difficulty in fencing the flywheel, but the railings now there admittedly complied with the Act. He thought that at the time the charge was brought there was a breach of the Act; but as the requirements had subsequently been met, the summons would be dismissed on payment of costs.

Leaving Work Without Notice.

At the Carmarthen Borough Petty Sessions last week, the Carmarthen Gas Company claimed damages for breach of contract against three men who had been employed at the works as labourers. It was alleged that the men had ceased work without giving a week's notice. On behalf of the defendants, it was contended that no arrangement as to the giving of notice had been arrived at between them and the Gas Manager (Mr. B. A. Lewis), and that the latter had, on more than one occasion, stopped them from working without giving any notice whatever. They had struck work because they wanted 21s. a week, instead of 19s. The Bench found that there had been a breach of contract, and ordered each defendant to pay 5s. damages and costs.

MISCELLANEOUS NEWS.

THE GAS QUESTION IN PHILADELPHIA.

Public Indignation at a Municipal Deal.

From a paragraph which appeared in the last number of the "JOURNAL," our readers will have learnt that Philadelphia, like New York, has lately been in the throes of a gas agitation. In each city there was a considerable amount of excitement; but it was much more intense in the former than in the latter. The result in the case of New York has already been recorded. In Philadelphia, however, so far as can be gathered from the accounts to hand, it has not yet been arrived at. The following particulars, obtained from local sources, will give an indication of the situation.

At the outset, it is necessary to go back to the early days of gas supply in Philadelphia. Lighting by gas was in the experimental stage when the works were established in 1835. Stock was issued for the construction of the plant; but the management of the undertaking was vested in a Board of Trustees, twelve in number, elected by the Councils. When, in 1841, it was determined that the city should become the owners of the works, loans were negotiated for the purpose; and until these were liquidated, the Trustees were maintained in office—one-third of the Board being elected yearly. In 1886 the last loans were paid off; and then the municipal authority undertook the management of the gas-works. During the succeeding years they were much improved; and their success attracted the attention of capitalists, who sought to obtain control of them on lease. All efforts in this direction were, however, unsuccessful until 1897, when Mr. T. Dolan, the President of the United Gas Improvement Company, submitted a proposal which, notwithstanding strong opposition from a party headed by Mr. Israel W. Durham, was accepted.

The outcome of these proceedings was that, as from Dec. 1, 1897, the United Gas Improvement Company were lessees of the gas-works on the following terms: The Company agreed to pay into the City Treasury about $1,000,000 in cash for the stock on hand, and also a rental of 10 c. per 1000 cubic feet of gas sold during the first ten years, 15 c. during the next five years, 20 c. during the subsequent five years, and 25 c. during the final ten years. They further agreed to supply the public lamps free, and to put up 300 additional lamps each year; also to spend $15,000,000 for extensions and improvements. Finally, they undertook to hand over the works free to the city after the expiration of thirty years. It was estimated by Mr. Dolan that the Municipal Exchequer would be enriched to the extent of $36,725,000 in thirty years under the terms of the lease. An important proviso in the lease was to the effect that the city should have the power to take possession of the gas-works at the expiration of the first ten years, on compensating the Company for any expense incurred by them in improving the works during that period; the amount to be determined by valuation. Under the Company's management, the works have produced profits estimated at between $3,000,000 and $4,000,000 per annum.

It has already been explained that, under the lease, the City would have the power of taking back the gas-works at the end of the first ten years. But as this period will not arrive till Dec. 1, 1907—nearly three years hence—it may well be asked: How comes it about that there is an agitation on the subject already? The following is the explanation afforded: The lease of the works was necessitated owing to the depletion of the public treasury consequent upon municipal extravagance practised in all directions; and there were no funds available to complete essential improvements. When the appropriations for the current year were apportioned some six months ago, it was recognized that the revenues would be insufficient to continue the work actually authorized, to say nothing of that which would be approved by the Councils during the current year. The re-imposition of the 35c. tax-rate taken off two years ago and another Loan Bill to provide about $14,000,000 for permanent improvements, were contemplated. But neither was regarded as a popular stroke of policy; and consequently the political financial managers of the Administration were in a quandary as to how to get out of their difficulty. The Councils were addressed by the Director of Public Works (Mr. Peter E. Costello), and were informed that the City needed money, as certain appropriations were "almost exhausted." Then, shortly after these communications, a rumour gained currency that something was in contemplation in connection with the gas-works. In view of the straitened financial position it was thought that the City would not be able to take possession of the gas-works on the terms laid down in the lease; but it appears to have been thought that the approach of the close of the ten-year period would be a good opportunity for making a "deal" with the Company. Several conferences took place between Messrs. Durham and Dolan, but only a select few of their friends were informed of their nature. At one of the meetings of the Select Council, an agent of the former gentleman submitted a resolution for a conference to be held with the officers of the Gas Company to consider the advisability of obtaining an advance payment of money which would be due under the terms of the lease. This resolution, however, was merely a blind, as a provisional agreement had been come to that, instead of the existing lease continuing for twenty years after the first ten-year period, a new lease should be granted for fifty years. Under the terms of this bargain, the Gas Company were to advance about $25,000,000 in cash, and the City would forego all payments in respect of the receipts from the sale of gas, as at present provided. It has been calculated that, on the increased consumption of gas for lighting, heating, and cooking purposes, the municipal revenues under the existing lease would amount in thirty years to $150,000,000, or a difference of $125,000,000 between this amount and the $25,000,000 to be paid for the fifty years' lease. For the thirty years' extension, according to the new lease, the city authorities would receive nothing; whereas if they took back the works at the expiration of the original term—viz., in 1927—they would have the advantage of all the money expended on the improvement of the plant, and would be able to profitably continue the manufacture of gas as a source of revenue.

When the general public became aware of the nature of the agreement come to by Messrs. Durham and Dolan, a great clamour was raised, which at last became so loud that fears were entertained for the lives of some of the parties principally concerned. The indignation of the citizens was expressed by thousands of them wearing buttons bearing a gallows and a hangman's noose, with these ominous words: "No gas steal. The last resort. We mean it." Arrangements were made for holding a mass meeting at which resolutions would be submitted emphatically condemning the proposal for a new lease; and it was decided to storm the Council Chamber when the matter came up for approval. Indeed, on one occasion when it was down for consideration, more than a thousand people gathered in the vicinity of the City Hall, in the expectation of seeing some sort of demonstration; but they were disappointed. Opportunity was, however, taken by one man to mount an equestrian statue and harangue the crowd in opposition to the granting of the lease. This display of public feeling caused a halt in the proceedings for at least ten days; and eventually both chambers of the City Council adopted a resolution directing the Committee on Finance to advertise in all the daily papers of Philadelphia that offers for leasing the gas-works would be received up to the 15th of May, and that they were to be each accompanied by a cheque for $250,000. The Mayor (Mr. Weaver) had sent a special message to the Councils on the subject, pointing out that it would be most improvident to pass the proposed ordinance. After referring to the financial position of the City under the present lease, he expressed the opinion that if the Councils, in their judgment, thought there should be a new lease at the expiration of the first ten years of the old one, it should only be granted to the highest bidder as the result of a public advertisement. The Councils were evidently at one with the Mayor on this point.

In compliance with the invitation contained in the advertisement, tenders were duly sent in and considered; but according to the latest advices, though a better offer than the Company's was submitted, the City Council, at their meeting on the 19th inst., decided to grant the extended lease on the terms suggested. Thereupon, according to the Philadelphia correspondent of the "Daily Telegraph," "the enraged ratepayers in the Chamber wanted to lynch the members of the Council, whom they denounced as common thieves taking bribes from 'the corrupt gang' which flourished at the expense of the ratepayers." The Mayor, who is a naturalized Englishman, headed the campaign against municipal corruption, which he described as a standing disgrace to American civilization; and he has compelled the local Republican "machine" to abandon its effort "to steal Philadelphia's gas." The result of his action has been that he has to defend himself against impeachment in the Courts; and he has engaged Mr. Elihu Root, formerly the Secretary for War, to conduct his case.

The Quaker City has been in perfect ferment over this business. According to a Laffan telegram, a mob of angry citizens last Thursday evening surrounded the mansion of Mr. W. T. Sykes, a wealthy member of the Council, who had voted in favour of the proposed deal with the Company. Mr. Sykes refused to come out, so the crowd began preparations for setting the house on fire. Before this was done, however, he, "trembling with fear and almost weeping," appeared on the verandah, and, lifting up his hand, swore that he would vote to uphold the Mayor's veto on the sale. We learn from the same source that "the police made no effort to interfere in the proceedings." Three other members of the Council, being threatened with demonstrations, publicly recanted, and promised to support the Mayor.

At public meetings which have been held, views have been expressed both for and against the position taken up by the Mayor. By the Press, however, he has been generally supported. The "New York World" exposes the whole affair in scathing terms; declaring that the "cancer of corporation corruption" is devouring nearly every city in the country. This "cancer" consists of some so-called company or other public service corporation "systematically debauching public officials who should check its depredations." "In all the globe," says the "New York World," "there is no other single source of social, industrial, and political corruption one-half so sinister as the American public service corporation under its present methods and management. The old Board of Works, about which we used to hear in London, to quote one indignant orator, was a "veritable angel of light" by comparison. The correspondent of the "Telegraph," already quoted, says: "It is significant that not a single voice is raised in defence of what Philadelphians called the 'gas steal;' and it is possible that this campaign against city municipal corruption may extend throughout the States." The Philadelphia case, to cite one journal, "is exceptional only in the degree of stench from the scandal and the open shamelessness of the men responsible for it." In this connection, it is mentioned that the same class of men who are responsible for the attempt to throttle the Niagara Falls by diverting the waters to power purposes without paying any compensation to the country for the deprival of its greatest scenic glory, are the men who "fasten like vampires" on the life of the American ratepayer from the Atlantic to the Pacific.

BIRMINGHAM GAS AND WATER UNDERTAKINGS.

At a Special Meeting of the Birmingham City Council last Tuesday, the reports of the Gas and Water Committees for the year ending March 31 were considered.

GAS COMMITTEE.

The report of the Gas Committee stated that there was a net surplus of £50,526, which in due course would be paid over to the Finance Committee in aid of the improvement rate of the city. In October, 1903, the price of gas was reduced; and the present accounts were for the first complete year at the lower charges. The smaller income from gas was due to this cause. The following are the contributions for public purposes from the gas undertaking for the year under review: In aid of the improvement rate, as stated above, £50,526; in aid of the improvement rate (interest on reserve fund), £4000; in aid of public

lighting within the city, £8971; in aid of court lighting within the city, £2242; and in aid of public and court lighting outside the city, £3750—making a total of £69,489. The quantity of gas sold during the twelve months was 6,293,810,600 cubic feet, as against 6,253,280,400 cubic feet in the previous year. This was an increase of 40,530,200 cubic feet, or 0·65 per cent. New services laid numbered 6766, as compared with 6924, or a decrease of 158. The total number of prepayment meters fixed at March 31 last was 36,375, or an increase of 6107 on the year; while the total number of cooking-stoves supplied to prepayment consumers at the same date was 19,829, or an increase of 7444. There were 545 cooking and heating stoves sold during the year, as compared with 626 in 1903-4. The total number of cooking and heating stoves on hire at March 31 last was 3431, which was a decrease of 84 when compared with the preceding year. Coke, breeze, and coke dust in stock on March 31 amounted to 15,833 tons, which was an increase of 7639 tons over 1903-4. Among others, contracts have been entered into with Messrs. Drakes, Limited, for the reconstruction of two benches of retorts in No. 1 Retort-House at the Windsor Street works, at a cost of £16,490; and with Messrs. Westwood and Wrights, for the reconstruction of No. 2 Purifying-House and Annexe at the Saltley works, at an outlay of £5495. The sum of £250 has been paid as compensation to a signalman employed by the Midland Railway Company, in respect of serious injuries which he sustained while on duty in a signal-box adjacent to the purifier-house when the explosion occurred at Saltley, in October last. Mention is made of the expiration of the period during which it was arranged that Dr. Harold G. Colman should act as Consulting Chemist to the department, and of the appointment, as from the 1st inst., of Dr. William B. Davidson, as Chief Chemist. The accounts (which are signed by Mr. G. Hampton Barber, the Secretary, and Mr. Alfred E. Morley, the Accountant) show that the total expenditure for the year was £704,401, as against £706,380 in 1903-4. Of this, £328,320 was for coal, including oil, carriage, unloading, and all other expenses of depositing same on works; the corresponding figure being £345,275. The net receipts from the sale of gas amounted to £669,161, as against £684,084; while residual products realized £197,183, compared with £199,418. The total receipts were £877,241, against £891,957 for the preceding twelve months. The gross profit was thus £172,839, compared with £185,577 for 1903-4; the deduction of charges for annuities, interest, sinking fund, &c., bringing the net profit to £50,526, which compares with £46,677 for the corresponding period.

In moving the adoption of the report, Alderman Sir Hallewell Rogers said he was sure that the satisfaction felt by the Committee at the results shown by the accounts would be shared by the Council. There was a surplus in aid of the improvement rate of £50,526, which, with other indirect contributions, made £69,489 for the year. This was the first time that the ratepayers of the city had received a contribution of £50,000 from the gas undertaking in aid of the improvement rate of any single year. In 1897-8, a surplus of £50,336 was declared; and again in 1902-3 a surplus of £56,920. The first-mentioned sum was divided and applied in aid of the rate for the two years 1896-7 and 1897-8; and similarly the surplus of 1902-3 was divided to meet the deficiency in the previous year, when £30,000 was anticipated, and a profit of only £553 resulted, and also to aid the rate of 1903-4. Thus in contributing to the improvement rate for the current year alone the sum of £50,526, the gas undertaking established a record—which was all the more satisfactory when it was remembered that this had been accomplished with charges for gas from 1s. 10d. to 2s. 6d. per 1000 cubic feet; whereas in the years previously mentioned the prices ranged from 2s. 3d. to 2s. 9d. The effect of such reduction in price on the income of the department would be apparent when it was known that 1d. per 1000 cubic feet on the quantity of gas supplied during the year represented a sum of £25,000. Referring in detail to some of the items in the accounts, he mentioned that the increase in the output of gas during the year had been less than usual owing to the trade depression of last winter. This would have been more marked than had been the case, had it not been counterbalanced in other directions—notably by the development of the prepayment meter system. These meters now numbered 36,375, with which nearly 20,000 cooking-stoves had been supplied. Fifty thousand pounds was the amount it was anticipated would ultimately be earned by the Gas Department and applied each year in reduction of the rates. The Committee hoped they would be able to maintain this sum in succeeding years; but having accomplished that, they were of opinion that the next consideration must be reduced charges for gas to the consumers. The present charges could not be regarded as excessive, though the Committee would like to see them still further reduced. On this point, however, he could make no definite statement till the coal purchases for the coming year had been completed.

The resolution was seconded by Mr. E. Martineau, who urged the desirability of reducing the number of openings in the roadways at present incident to the operations of the Committee, which averaged three to every 100 yards of road. Sir Hallewell Rogers promised that this matter should receive attention; and the report was then approved.

Water Committee.

The report of the Water Committee, also for the twelve months to March 31, stated that the water-rents showed an increase of £6733—being 2·57 per cent. over the total for the previous year, against an increase of 2·27 per cent. in the last accounts. There was a gross profit on revenue account of £164,908, or an increase of £7384 on the corresponding figure for the previous year. The charges on account of capital, shown in the profit and loss account, amount to a net total of £256,734, and result in a deficiency for the year of £91,826. This has been covered by a contribution of £45,000 from the borough fund and rate account, and the transfer of the balance of £46,826 to the capital account for the Elan supply, under section 22 of the Corporation's Act of 1902. The amount of interest on the expenditure in connection with the Elan scheme permitted to be capitalized under the section referred to is £60,000 in any one year, up to a total of £300,000. The total so capitalized up to the present is £80,644. The financial result of the year's working was again slightly more favourable than the anticipation of the Committee, notwithstanding that in their previous estimates they had calculated that pumping on the old supply would by this time have been reduced to a minimum by the full introduction of the Elan water. This had, however, not yet been fully accomplished, though a very large diminution of pumping had already taken place, and the minimum would be reached very shortly. In preparing their estimates for the coming year, the Committee found it impossible to forecast the results with any certainty, as the working under the new scheme had not yet reached normal conditions. They did not anticipate, however, that the results of the current twelve months would differ so materially from their previous forecast as to interfere with their general scheme of finance; and they had accordingly requested the Finance Committee to provide the same sum from the rates as last year—namely, £45,000. The payments for rates and taxes showed an increase of £4488 over the corresponding period; the principal items of the increase comprising rates paid in respect of the works in the Elan Valley, on the aqueduct, and at Frankley, which became rateable when they passed into use. On the other hand, full rates have at present had to be paid in respect to the old works and the service-mains. The Committee had lodged objections to the old assessments, and considered they were in a position to demand substantial reductions, which should secure some relief on the next accounts. The daily average distribution of water for the year increased from 18·013 million gallons to 18·230 millions, which was equivalent to a rise of 1·16 per cent. The increase during the first six months was 4·37 per cent.; while in the second half year there was a decrease of 2·19 per cent. In the opinion of the Committee, the latter result was to be attributed, to some extent at any rate, to the fact that the quantities distributed under the new supply were measured at Frankley by modern accurate apparatus, as against the old method of computation. The results seemed to indicate that the old arrangements recorded consumptions somewhat in excess of the actual quantities. The amount expended on the works in the Elan Valley during the twelve months was £172,545, giving a total of £1,776,249. The outlay on the whole scheme during the year was £283,514; making a total of £5,539,506. The amount received from water-rentals was £268,545, as against £261,812 in 1903-4; while the total number of houses in supply increased from 167,012 to 170,160. The average gross consumption per head per day (the estimated average population in supply for the year, based on 4·5 persons per house on the average number of houses in supply, being 758,637) was 24·03 gallons. Of this, the net estimated consumption per head per day for domestic purposes, fire, and waste was 14·28 gallons, as against 14·60 gallons in the previous year, and 16·99 gallons in 1899-1900.

Alderman Lawley Parker, who moved the adoption of the report, remarked that the water-rents showed an increase of £6733; being 2·57 per cent. over the total of the previous year. This amount was what they had been anticipating from time to time; and it was satisfactory that, in the present condition of trade, it had not gone back. Another satisfactory point was that the £45,000 out of the rates would be enough to meet the deficiencies of the year, and that they had not charged the utmost amount that they could have done to capital account under the terms of the Act. As regarded the consumption of water, there was a very small increase compared with the previous year. But, as the report explained, something of this might be due to the fact that more than half of the water was being more accurately measured by the gauges now in use than was possible when the amount of water was arrived at by the pumping of the engine. They were now, in fact, getting the accurate amount of the water they were using so far as the Welsh supply was concerned; and it would not surprise him to find that when the whole of the Welsh water was in use, and they discontinued—for a long time, he hoped—any use of the old supply, it would appear as though the consumption of water had been reduced, when, in fact, it would not be so, but the difference would merely be because they had an accurate way of measuring, which they never had before.

The report was adopted.

GAS PROFITS AND THE RATES AT COVENTRY.

The annual report of the Gas Committee which was presented to the Coventry Town Council at their meeting last Tuesday stated that the total revenue for the year was £100,309, and the expenditure £80,868—leaving a gross profit of £19,441. To this had to be added the carry forward from the previous year and interest received, making a grand total of £21,981. Against this had to be placed capital and other charges amounting to £18,196, leaving a final balance of £3785. As to the disposal of this sum, the Committee recommended that £1000 be set aside to meet the loss of capital (estimated at £50,000) consequent on the abandonment of plant at the old gas-works when the new works at Foleshill are in full operation, that £2000 be paid to the district fund; and that the balance of £785 be carried forward.

The Chairman of the Committee (Alderman Booth), in moving the adoption of the accounts, said dulness of trade during the year curtailed gas consumption; but, on the other hand, coal had been cheaper, so that the revenue account, which was really the trading account, showed an actual increase in gross profit of £1379. Coal cost nearly £3000 less, though the Committee had carbonized 290 tons more. The amount for oil was less than in the previous year; but this was due to less water gas having been made, the price of oil having been about the same. The increase in repairs and maintenance of mains and services amounted to over £2000. A new main was laid during the year; and, in addition, very considerable expenditure was entailed in laying mains under the footpaths in the streets where tram-lines were put down. A great many services had also to be renewed, so that these streets, when remade, should not be disturbed again by the Gas Department. All these extra expenses were taken out of revenue. There was a considerable reduction in the amount received for gas consumed through ordinary meters, but a satisfactory increase from prepayment meters. The decrease in gas consumed through ordinary

meters was no less than 26,970,600 cubic feet, or 4·90 per cent.; but the increased consumption by prepayment meters was 16,462,100 cubic feet, or 29·93 per cent. There was a slight increase in the quantity of gas used for public lighting; and, including this, the net result in the total gas consumed was a reduction of 10,114,925 cubic feet, or 1·64 per cent. The other items of receipts were satisfactory; and the result was a gross profit of £19,400, or an increase of £1379 over the previous year. The profit and loss account had had much heavier charges to bear than in the former year. The contributions to sinking fund had increased by £1346, interest paid and income-tax were £2433 more, and loan capital charges £596 more—or a total increase of £4375. There was in the year an increase of only eleven consumers using ordinary meters, but an increase of 1389 supplied with slot meters; so that the popularity of the latter still continued. As to cooking-stoves let on hire, there was an increase of only six; while there was an increase of 1569 cookers fixed for slot consumers. With regard to the new works at Foleshill, progress was not being made quite as quickly as the Committee would like, owing to one of the contractors being very much behind time; but a considerable number of contracts were let, and would be pushed on with during the year. The acid works which were sanctioned by the Council last year had been built; and these, together with the sulphate works, were in operation. The prospects for the coming year were promising. The Committee had made contracts for the supply of coals at a slight reduction on last year's prices, and a very healthy increase was taking place in the gas consumption.

After the resolution had been seconded, Alderman Andrews asked when the price of gas was likely to be reduced from 2s. 6d per 1000 cubic feet to 2s. 4d.—its old figure—and Mr. Lee said he thought the Committee ought to contribute a larger sum in support of the rates. Mr. Colledge pointed out that the Committee would have been in a better position had not the Finance Committee borrowed on their account a very large sum of money before it was really all needed. Mr. Goate denied that the Finance Committee had acted unwisely, and said they provided for the past year something less than the amount of capital the Gas Committee estimated they would spend. As it happened, however, the Gas Committee's outlay was little more than half the sum estimated; and in this way there was a balance left.

In reply, Alderman Booth said that this was not the time to reduce the price of gas. The capital was increasing; and the Committee would have to contribute more and more by way of interest and sinking fund. Until, therefore, the new works were going, it was not desirable to reduce the charges for gas to the public. Mr. Lee pleaded in the opposite direction—he wanted them to keep up the price of gas and give more to the relief of the rates. The Committee did not think it desirable to charge high prices so as to give a large sum to the district rate.

The report was adopted.

COST OF GAS AND ELECTRICITY AT NEWCASTLE.

Mr. George Lamb, the Lamp Inspector at Newcastle-on-Tyne, has prepared a report showing the cost of lighting certain central streets in the city by electric arc lamps and by the self-intensifying lamps the Gas Company have been installing. The former work out at £1920 per annum, or £1155 more than would be required for gas. The cost has been reckoned on a basis of £12 for each 10 ampere arc lamp burning about 2793½ hours a year; and £4 1s. 9d. per gas-lamp, each fitted with an automatic controller, and burning about 3776½ hours. When desired, half the gas-lamps could be extinguished by the controller at midnight, thus reducing the annual cost of those so dealt with to £3 7s. 7d. each. These figures would be further reduced after the first five years, when the payment of 5s. 7d. per lamp, the amount of interest and redemption of capital cost of the controller, would cease. The 160 arc lamps estimated for would have a total illuminating power of 112,000 candles, as against 56,100 candles for the 187 self-intensifying gas-lamps. Thus while the increased rate of cost per cent. of the arc lighting over gas would be 151·3, the increased rate of candle power per cent. would only be 99·6.

DISPOSING OF THE PROFITS AT NEWBURY.

At the Quarterly Meeting of the Newbury Town Council last Tuesday, the Gas Committee reported the results of the past year's working, and recommended that the price of gas be reduced from 3s. 4d. per 1000 cubic feet with 4d. discount, to 3s. 3d. with the same discount as before, and that £250 be paid to the district fund.

The adoption of the report was moved by Alderman Smith, who pointed out that there had been an increase of 2¾ million cubic feet in the output of gas. The gross profit on the year's working was £2804; and after allowing for instalments on sinking fund and interest to the total of £1914, there remained a net profit of £890. The reduction sanctioned last year of 4d. per 1000 cubic feet represented a loss of income of £800 to the undertaking, which also lost about £80 on the reduction in the charge for stoves, and a further sum of £53 on the supply of gas to the pumping-station. But in spite of these circumstances, they were in quite as good a position as last year; and if the recommendation of the Committee was adopted by the Council, it would bring the price of gas down to 2s. 11d. per 1000 feet, and thus place Newbury below all other towns in that neighbourhood. The question of a reduction in price to consumers of gas for power purposes had been carefully considered by the Committee, who had been furnished with details as to the number of large consumers; but after full discussion, they regarded the reduction of 1d. per 1000 cubic feet all round as likely to meet every requirement.

The motion having been seconded, and congratulations offered to the Committee on the report, Mr. Beynon said he did not regard £250 as nearly enough to vote to the district fund. He proposed as an amendment that the amount be altered to £500; and this was seconded. Other members advocated a further reduction in price, rather than an increased grant in aid of the rates; the contention being that the consumers should reap the benefit of the good results, and not those who never did and never would support the undertaking. In view of the opposition accorded to the amendment, Mr. Beynon withdrew it; and it was then agreed to embody in the report a clause granting to the workmen a bonus, as was done the previous year.

Later in the discussion, Mr. Stradling moved an amendment that a sliding-scale of charges be devised for those consumers who used gas for power purposes. He alluded to the likelihood of competition from electricity, and said that there were several firms waiting for the result of the meeting to see what was to be done for them; and if it was not favourable, they would adopt electric power. Mr. Elliott seconded the amendment; pointing out that by granting such a concession they would be opening up a fresh field of custom. The amendment, however, met with little support; it being regarded as an injustice to make the price less to one set of customers than to the smaller users who formed the real backbone of the concern.

The report of the Committee was thereupon agreed to.

THE CONDITIONS OF LABOUR AT STOCKPORT.

The Stockport Trades and Labour Council have been busying themselves with the internal arrangements at the gas-works. At a meeting last week, the Secretary announced that the municipal employees had passed a resolution appealing to the Gas Committee to give a decision with regard to the request of the workmen for improved conditions of service "so as to bring them on a par with their fellows in other towns." The resolution added that it was about six months since the workmen's request which was referred to was laid before the Committee. After some discussion, the Trades and Labour Council unanimously adopted the following resolution, which was ordered to be sent to the Gas Committee: "That this meeting appeals to the Stockport Corporation Gas Committee to give a decision to the request made to them by the Municipal Employees' Association for improved conditions of service, believing from the information supplied to them that the conditions are not the same as obtain in any other town for the same class of work."

DUKINFIELD CORPORATION GAS SUPPLY.

The Past Year's Working.

As briefly mentioned in the last number of the "JOURNAL," the Engineer and Secretary of the Gas Department of the Dukinfield Corporation (Mr. Harrison Veevers) has lately presented his report on the working of the undertaking in the year ended March 31. He states therein that the expenditure on the repair of works exceeded that for 1903-4 by £192, and on mains and meters by £385; the former being due to the removal of boilers, repairs to the exhauster engines, and rearrangement of works consequent on the erection of the new retort-house. There was an increased charge for meters, owing to the number of exchanges of defective ones; but to keeping up the quality of these and the mains Mr. Veevers attributes the reduction of the leakage by 3 per cent—from 14·03 per cent. to 10·86 per cent. Rates were higher last year by £250 than in 1903-4; and, owing to bad trade, £1468 less was realized for gas and residual products. The total quantity of gas made was 85,654,000 cubic feet, of which 76,352,100 cubic feet were sold, apportioned as follows: To cottages, ordinary consumers, 37,391,200 cubic feet; do., slot-meter consumers, 8,224,850 cubic feet; to mills, 23,587,496 cubic feet; to public lamps, 5,885,616 cubic feet; to office, works, &c., 1,262,938 cubic feet. The cost of coal and cannel was £4354, or an average of 11s. 7d. per ton. The make of gas per ton was 11,405 cubic feet, of which 10,166 cubic feet were sold. The following were the items of income: Gas, £10,182; tar, £671; sulphate of ammonia, £478; coke, £1784; meter hire, &c., £22. The price of gas was 2s. 9d. per 1000 cubic feet, varying, according to consumption, from 1d. to 5d. per 1000 feet below the rate named.

Kimberley Water-Works Company, Limited.—The 25th annual general meeting was held a few days ago at the Cannon Street Hotel—Mr. James Jackson presiding. In moving the adoption of the report, he pointed out that in ten days from the day of the meeting the Company's old concession would lapse. They had paid in dividends nearly £410,000, or at the rate of over 6½ per cent. a year. In addition, they had paid off out of revenue nearly £30,000 of debenture debt, and written off substantial amounts from the construction account. Their hope for the future lay in a reduction of expenses. Mr. A. J. Macdonald seconded the motion, which was adopted.

The Dover and Northumberland Clauses.—Messrs. R. W. Cooper and Sons write on this subject as follows: Referring to your comments, in the "JOURNAL" for the 16th inst., on the form of the clause as to revision of prices inserted in the Dover Electric Lighting Provisional Order this session, you say that "there are certain points about it which might, with advantage, be amalgamated in the Northumberland clause of last year." The reason why this clause appears in its present form is that the Corporation of Dover are already working their electric lighting undertaking under a clause in that form, which was inserted in the Dover Corporation Act, 1903, at the instance of the Dover Gas Company. The Northumberland clause certainly is unsatisfactory in certain points; but no doubt gas companies generally have deemed it inadvisable to make any attempt to get a Committee to insert an improved form so soon after the Duke of Northumberland's decision. It is clear, however, that the attempt will have to be made sooner or later.

MONTE VIDEO GAS COMPANY, LIMITED.

A Large Reduction in Price.

The Ordinary General Meeting of this Company was held last Thursday, at Winchester House, Old Broad Street, E.C.—Mr. T. C. TATHAM in the chair.

The SECRETARY (Mr. Henry Kearns) read the notice convening the meeting and the Auditors' report; and the report and accounts—which were referred to in last week's "JOURNAL," p. 523—were taken as read.

The CHAIRMAN, alluding to the accounts, said that on the debit side of the balance-sheet they would see the share capital remained the same, as did also the amount of debenture stock. The debenture debt had been reduced by £5080, which was paid off in January last; and there now remained only £5360 owing of this debt, which would be paid off next year. The old debenture debt would then be wiped out entirely. The reserve account stood at £29,120, the insurance fund at £12,500, and they had added to the contingency account from the profits of the year £1500—increasing it to over £16,000. In addition to this, £1000 had been reserved for renewals. Turning to the credit side of the account, the capital expenditure stood on Dec. 31, 1903, at £599 769. The sum of £3597 had been written off for depreciation; and on new services, meters, and other items about £1500 had been spent. This brought the total capital expenditure of the Company now to £597,666. The stock of coals was about £700 more in value than at the corresponding time last year; while the gas-fittings showed a reduction of about £800. He thought they had now got this account into reasonable limits; and they would remember that from time to time he had expressed his desire that it should be reduced. He thought the highest figure it had stood at was in the neighbourhood of £12,000. Residual products were about the same. Materials for use—an item regarding which he was generally asked questions—were about £1100 less. They comprised all the variety of goods necessary for a gas company to keep in stock. Materials for sale—which were mainly for use in their dock and dock workshops—were some £1200 more. Sundry debtors at Dec. 31 last were about £4500 more; and the value of the Company's investments showed an appreciation of £280. Shipments afloat were £2300 less. The Company had in hand bills for about £4000 more than last year; but, on the other hand, their cash on deposit was a similar amount less. These figures, however, varied a good deal according to the time of year. Coming to the revenue account, he thought when they recollected that during nearly the whole of last year Uruguay was in the throes of revolution, they had every reason to be satisfied with the results of the working. In addressing the shareholders twelve months ago, he said the Board could not but see that the revolution was telling, and would tell, severely against the Company this year, as the theatres had been closed, business had been stopped, and people had been leaving the city. The result of the working of the gas department had been a decrease in receipts of £10,393; but, on the other hand, they would see that the revenue from the dock branch had increased by £16,000. They were fortunately full of general work during the whole of the year, and they were also lucky in obtaining a considerable amount of heavy work for an important steamship company. They could not expect to be so fortunate every year; but, at any rate, the results on the present occasion showed the capacities and capabilities of this dock department. They had been doing fairly well with that branch during this year; but he regretted to say that only a week ago the Board received a cable from the General Manager telling them that there was a general strike in Monte Video of all classes of workmen connected with the shipbuilding trade. Of course, they hoped that this would not last long; but the feature was a bad one, and could not but interfere with the prosperity of the department. The total working on the year of both branches of the Company's business showed that, after facing that loss of £10,393 in the gas department, they were yet enabled to carry to profit and loss a sum of £28,112, which was only £409 less than for the year 1903. If they would turn now to the profit and loss account itself, they would see that, after paying interest on the debentures, debenture stock, and income-tax, the Directors wrote off £885 for bad debts; and he thought they might congratulate themselves that, under the circumstances, the bad debts had not been more. But after very careful consideration, the Board believed the amount named to be quite sufficient. As he had already mentioned, they wrote off for depreciation £3547; and they also reserved £1000 for renewals, and transferred to contingency account £1500. The dividend would absorb a sum of £18,967; and the remaining £1722 would be added to the undivided balance, which would then amount to the respectable sum of £10,139. This concluded the remarks he had to make on the financial position of the Company; and he ventured to think that, on the whole, the shareholders had every reason to be satisfied with it. There was, however, a matter of importance mentioned in the report to which he desired to call attention; and this was that the Directors had, after much consideration, decided to reduce the price of gas by 2s. 9d. per 1000 cubic feet, as from April 1 last. They had been intending to do this whenever the financial position made it possible; and they could easily see that if the business in the gas department last year had been normal, this would have been a most favourable time to do so. The Board were of opinion, however, that, even in the face of this great reduction in the gas business, it was not prudent any longer to delay lowering the price. They trusted that this step would not only enable the Company to recover those customers that had been lost during the revolution, but also to materially increase their number. Many of the shareholders who were in the habit of attending the meetings knew the difficulties which for some years past the Company had had to contend with—how they had lost the whole of the public lighting of the city, which amounted to as much as £23,000 a year. And although this no doubt was ancient history, still it was the dominant factor in their position to-day, because it was on the faith of supplying the public lighting and the private lighting that the capital of the Company was made what it was. The whole of the public lighting in the city of Monte Video and the borough of Pocitos was now done by the electric light undertaking, which was the property of the Government itself; and the Board had just heard that it was their intention—it had not yet been done—to reduce at an early date their price, though he did not know by how much. He regretted to have to refer to the great loss the Board had sustained by the death of their late colleague, Mr. M. T. Hood. He was for many years Consul at Monte Video, and was thoroughly acquainted with the place and its habits, and spoke the language. They had, however, been very fortunate in being able to induce Mr. Charles Hunt, one of the leading engineers in the gas world, to join the Board. He concluded by moving the adoption of the report and accounts.

Mr. SIMPSON ROSTRON having formally seconded the motion;

The CHAIRMAN replied at some length to questions put by shareholders. In the course of his remarks, he said that if the Directors had been able to reduce the price of gas years ago, they would have done it; but their position was not anything like so strong as it was at the present time, and so they could not afford to face the question. The price now charged for electric light was 1s. per unit. As he had already stated, he did not know what they were going to reduce it to; but, at any rate, with gas at the Company's price and electricity at the Government's price, he thought their Company gave a much better light for the money. With regard to the cost of manufacture, it was impossible to reduce standing expenses simply because the receipts fell off; and although it was true that considerable reductions in expenditure had been made, the Board could not pretend that the decrease in the cost of manufacture had anything like kept pace with the decrease in the receipts. But these costs of manufacture and expenses at Monte Video, of course, included the expenses of the dock; and when they considered that the Company had made £16,000 more at the dock, they would not wonder that the outlay also had increased. As to the sales of gas since April, when the price was reduced, he might say that they had had a satisfactory increase of consumers; but whether by the end of the year this gain would be sufficient to balance the loss which must be incurred by the decrease in price, he could not tell. If they could do so with safety to the interests of the shareholders, it would be the policy of the Board to reduce the price still further. He believed—and his colleagues, who had great experience in the gas world, believed—that the cheaper the gas supply the larger was the number of consumers obtained, and the better was the basis on which the undertaking was established.

The resolution was then carried unanimously.

On the motion of the CHAIRMAN, seconded by Mr. ROSTRON, a dividend was declared of 8s. per share, less income-tax; making, with the interim dividend of 6s. per share, a dividend of 3½ per cent. for the year.

The Directors retiring by rotation (Mr. Simpson Rostron and Mr. Charles Hunt) were then re-elected.

The CHAIRMAN, in proposing the latter gentleman, said the Directors considered themselves extremely fortunate in being able to secure on their side of the table the services of a man with the very great experience of Mr. Hunt; and he was sure the Company would be the gainer by his presence on the Board.

Mr. ROSTRON, who seconded, remarked that he had been connected with gas for a long time—certainly for twenty years—and he had always been accustomed to hear Mr. Hunt quoted as one of the greatest authorities on gas matters.

The Auditors (Messrs. Price, Waterhouse, and Co., and Mr. T. S. Soden) having been re-appointed,

The CHAIRMAN moved a vote of thanks to the staff of the Company for their services during the past year, which, he pointed out, had been a period of very great anxiety. It could be imagined under the circumstances what the position was; and the Company had come most satisfactorily through their difficulties. All the officers, both here and on the other side, most ably and diligently did their duty during this trying period.

Mr. CHARLES HUNT said he had pleasure in seconding the motion, because he felt confident that the officers were well deserving of the thanks of the shareholders, particularly having regard to the events of the past year.

The vote was unanimously accorded; and a similar compliment to the Chairman and Directors concluded the proceedings.

CAPE TOWN AND DISTRICT GASLIGHT AND COKE COMPANY, LIMITED.

Depression and Profits—Poor Residuals Demand—Prospects Bright.

The Ordinary General Meeting of this Company was held last Thursday, at the London Offices, New Broad Street House, E.C.—Mr. J. E. LILLEY, J.P., in the chair.

The SECRETARY (Mr. H. Yuill) read the notice calling the meeting; and the report and accounts were taken as read.

The CHAIRMAN—in moving the adoption of the Directors' report and accounts, and the payment of a dividend at the rate of 10 per cent. per annum, free of income-tax (making 10 per cent. for the year)—first referred, with great regret, to the death of the Company's old and much-esteemed friend and Chairman, Mr. John Boustead, who had been connected with the Company from its inception. He was a loyal Director, and had always the interests of the Company at heart. His place had been filled by the election of Mr. Cecil W. Lilley, of the Middle Temple, who was his (the Chairman's) son, and to whom the shareholders might look for faithful and intelligent service. Regarding the accounts, the Directors put them before the shareholders with very great pleasure, because they considered that they showed good results for a most trying period. The results had been attained under circumstances that were most unfavourable to successful trading. The commercial depression which had set in in South Africa was followed during the year by acute financial depression; and they knew that, when financial depression supervened as a second influence after commercial depression, the results were very severe indeed. He referred to these effects, and then, proceeding, said that altogether trading profits generally

in Cape Town had been very unsatisfactory. Their Company, however, might count themselves among the more fortunate exceptions to the general rule. The reason why they might do this was largely because they had, as the shareholders knew, during recent years extended very largely indeed the boundaries in which they supplied gas. Therefore, the Directors were glad to come before the shareholders showing they had been able to make and distribute their ordinary amount of profit, and also to distribute it free of income-tax. At the same time, it would be observed that they had not in any way starved the plant, buildings, or other property, because they had spent even a larger amount than usual in preserving them in good order. In addition to the loss, or diminution of business, in their old districts (which, however, had been made up from other districts), they had suffered considerably through their inability to dispose of their chief residual, coke, at anything like ordinary prices. As he had said, the condition of trade had been very bad; and this involved the trades in which their coke was used for manufacturing purposes. Their condition had been so bad that the demand for coke had been very much less than in previous years, and, in fact, some of their sources of disposal had been absolutely closed. They had therefore received for coke a smaller amount by no less than £7500. From this it would be seen that they must have a very sound business to be able to stand against such fluctuations as this, and yet come out on the right side. He was sorry to say that they had experienced dishonesty among some of their subordinate officials in Cape Town. It was early in the year that they received a communication to the effect that defalcations were believed to exist among certain officials. Their Managing-Director (Mr. J. A. Kelman) went out to the Cape; and, with the thoroughness which characterized everything he did, he went into the matter, and made arrangements for a most searching inspection. The result was they found they had been robbed of some hundreds of pounds They had now, however, placed everything on a certain foundation, and had made arrangements under which their accounts would be subjected to a special check throughout the whole year. There was another matter which also affected their profit. The Colony found its revenue from the ordinary sources of taxation, which had hitherto been almost all of an indirect nature, was not enough, and it had resorted to an income-tax of 1s. in the pound. Of course, they could not grumble. It was a necessity for carrying on the Government of the country where their business existed; and they must be willing to contribute their share, so long as was necessary. It, however, meant a big sum of money—costing them something like £1200 last year. Notwithstanding all these unfavourable things, they were able to do very well on the year; and therefore they could not complain. Personally he thought that they had seen the worse part of the depression in Cape Colony, and that things were now rather on the mend. Commenting upon the condition of affairs that existed in Cape Town during the war, when such immense shipments of goods and men passed through the port, he remarked that the Company had one great disadvantage during that time, from the fact that the harbour was so packed with shipping of every kind that their coal ships had to lay there sometimes for months until they could get them unloaded. They were put to the greatest straits to get their coal; and this cost them a lot of money. They were now freed from this; and they were able to get coal much more cheaply than before. As to the accounts, the gas-rental had been more during the year, from the fact that they made 13 million cubic feet more gas than ever before. But he did not recommend the shareholders to expect the increases to go on at this rate in the future. Possibly this might be the high-water mark for a little time; but he had no doubt they would largely over-top it in two or three years. There was a little tendency, however, for increases to be of a much more steady kind than hitherto. This was caused not only from the fact that they had to cut off the supply of gas in some cases, but people were using less to assist in keeping down their expenses, and there was now a much more rapid adoption of the incandescent mantle. The Company were doing their best to make it popular by decreasing the price from time to time—as fast, in fact, as they were able to purchase more cheaply themselves. The Company did nearly all the trade in the mantles in the town, and by far the greater part of the trade in gas fittings and burners. The Directors thought it good policy that these should be sold with a very small proportion of profit, in order that people might be encouraged to use the incandescent system. In regard to the sale of residuals, as he had remarked, they received about £7000 less for these than in the previous year. This was entirely owing to the necessity for their reducing the price of their coke. They made large quantities; but the demand for it had not been anything like so lively. If the price to which they had reduced it did not enable them to find a market, they would reduce it still further. They had also taken other steps to help them with regard to coke—he referred to the adoption of the system of water-gas making. Their Manager reported very satisfactorily indeed on the plant which they had installed for this purpose. The sale of fittings during the year had been less, but not to an extent of any importance. On the other hand, the cost of coal and generally of manufacture had been less, although they had made considerably more gas. They bought their coal well during the past year, and had made a contract on equally satisfactory terms for this year. Then on repairs and maintenance, they had spent a large sum indeed; the time being very opportune. Their buildings were mostly roofed with corrugated iron; and almost all of them had been re-roofed during the year. Their retort-settings had been kept in thoroughly good order; and their mains had had considerable attention bestowed on them. Rates and taxes had increased during the year; being £4884, as against £2966. As he had mentioned, there was the £1266 for income-tax. The rates were also more on account of their area having been extended, because to those municipalities who had admitted them to their roads, they had to pay so much per mile for their mains. Law charges had also increased. They had had great difficulty in the disposal of their tar. Ever since the inception of the Company there had been no market for it, excepting in small quantities; and for years and years they could do nothing else with it but pour it away on waste ground. They tried all sorts of things—making gas and burning it; but it was not a success. Last year, however, negotiations terminated in an offer by a firm to take the surplus tar, at a stated price. The Directors agreed to accept the offer for the quantity named, provided they had it to dispose of. But the agreement that was drawn up on the other side had ended in difficulty. The firm in question considered they were entitled to more tar than the Company supplied to them; and it had resulted in the Company paying them damages (not so much as they claimed) and their law costs. However, the Company did get a considerably increased sum during the year through their ability to sell to these people, who, since the time referred to, had themselves not conformed to their contract, and had become liable to pay the Company a sum—though smaller than what the Company had to pay them. For bad debts, the Directors had reserved something like £1769. In commenting upon the items of the balance-sheet, he mentioned that stocks had been reduced to the extent of about £8000 during the year. The Company had accumulated a considerable stock on account of the works they had carried out; and their stock of fittings was also smaller. But the stock of coal was almost double what it was this time last year; they having had very favourable opportunities for shipping it at the end of the year. During the year, they had laid 6 miles of new mains; and one municipality who had never admitted the Company to their roads before, because they had the electric light, had now permitted them to supply gas within their district.

Mr. H. R. SAVORY seconded the motion, which was unanimously adopted.

The retiring Director (Mr. R. A. Fairclough) and the Auditors (Messrs. C. F. Kemp, Sons, and Co.) were re-elected.

The usual complimentary votes terminated the proceedings.

SOUTH AFRICAN LIGHTING ASSOCIATION, LIMITED.

The War and Depression in South Africa—Signs of Improvement.

The Ordinary General Meeting of this Company was held last Wednesday, at the London Offices, No. 90, Cannon Street, E.C.—Mr. D. FORD GODDARD, M.P., in the chair.

The SECRETARY (Mr. W. Cash, F.C.A.) read the notice convening the meeting; and the Directors' report and the accounts were taken as read.

The CHAIRMAN, in moving their adoption, said that the report informed the shareholders that, for the first time in the history of the Association, there had been a decrease in the quantity of gas sold at Port Elizabeth. At the last meeting, he said a few words in regard to the reduced consumption there; and he remembered that he then attributed it largely to the change of time, which had affected the hours of lighting. There was no question about it that it had done so. But, in addition, this last year had been one of the most depressing known for a long time; and they found that other companies were suffering exactly in the same way as themselves. Trade generally had been very bad; and competition with other ports had somewhat seriously affected the particular place with which the Association were chiefly concerned—that was Port Elizabeth. They therefore, on the year, showed a decrease in consumption of 1·73 per cent. He thought, however, there were signs that the depression was passing away. The last report received showed a little increase as compared with the previous year; and the Directors were therefore hopeful that the temporary depression had now gone, or was on the wane. At Grahamstown, there was a slight increase in the consumption, which he thought would continue. One thing was very satisfactory, notwithstanding the decrease—that was, the use of gas was becoming more popular, and the number of consumers was increasing; so that they had every reason to suppose that, in the course of a little time, matters would all come right. There had been an increase of 218 consumers during the year at Port Elizabeth, and of 27 at Grahamstown. This, he thought, was very satisfactory. Then another matter for satisfaction was in regard to the leakage. At the meeting last year, he mentioned that in this respect they showed some reduction; and they had since done better, because in Port Elizabeth they had reduced the leakage to just over 4 per cent. It was 7½ per cent. in 1903; so that here they had a real saving. In Grahamstown, too, they had reduced the leakage to about 4½ per cent. This was very satisfactory; but the shareholders would understand that this reduction in leakage was partly due to the fact that they had spent a great deal of money on repairs to their mains, and putting them generally into good order. In fact, as they had been having a slack time, and the conditions were favourable, they had spent during the year rather a larger amount than usual on the mains and other parts of the plant; and the corresponding effect of the large expenditure had been this reduction. The cost of coal was practically about the same as last year. It was a trifle—but only a trifle—more. There were signs of a little reduction this year; the last contract they had made showing an improvement in price in the right direction, which he hoped would continue. At the last meeting, he also reported that the carburetted water-gas plant had been completed; and they had been using this plant during the year. The Manager was very pleased with the results, and reported that the plant had been of great use, had given considerable satisfaction, and was working in a very pleasing way. The cost of the carburetted water gas was favourable in comparison with that of the coal gas; and the Directors had every reason to believe that this addition to their plant would not only be an economical one, but that it would save them some little anxiety in the future. During the year the capital expenditure had been something like £6000; the larger part of this having been paid for the carburetted water-gas plant. On new mains, too, a large amount—nearly £2000—had been spent. This was a necessary expenditure; and he hoped it would bear fruit in the future, and that they would get a fair return from it. They had had a rather unexpected claim made upon them during the year on account of demurrage in connection with one of their coal ships. They were led to believe that their charter-party safely guarded their interests in the matter. The question went to arbitration. But this unfortunately went against the Association; and a claim of £1300 had to be paid. The Directors set aside something against this in last year's balance-sheet; so that it

did not mean a total loss on this year. They had now altered their charter-party, and had, they hoped, framed it in such terms that such claims as this could not arise. Probably the shareholders would know that at Port Elizabeth, where so much of the discharging was out of their own hands and control, it was exceedingly difficult always to safeguard one's own interests. In the last report, the Directors referred to the reduction in the price of gas, which step was taken largely on account of the prosperous year that they had had, and which also enabled a little extra to be then paid to the shareholders in the way of bonus. This reduction had cost them in money £687. Then they had had another charge come upon them which they had never had in any previous year. He regretted it very much; but it was a matter over which the Board had no control, and all they could do was to bow to it. The Colony had imposed income-tax upon all undertakings within its reach; so that now they had to pay income-tax in England as well as in South Africa. This had cost them £518. When the items he had mentioned were taken into consideration, together with the greater outlay on repairs and renewals, the accounts were really better than they appeared on the face, and there was nothing to cause the shareholders any anxiety in regard to them. They had invested over £2000 of their reserve fund; and, in doing this, they were meeting the views to which shareholders had often given expression, that the reserve fund should be as much as possible invested otherwise than in the concern itself. As the shareholders were aware, Mr. Corbet Woodall had paid a visit to South Africa, and had thoroughly examined their works; and he would be able to say that the works and all the plant were in excellent order, and would very probably wish to add a few words as to the excellence and fidelity of their officials in South Africa. Of course, it would be remembered that Mr. Woodall had a further object in his visit of inquiring into the question of new business in other towns; but he (the Chairman) did not think it would be wise to say much about this on the present occasion. He was sorry to have to report that their friend and colleague, Mr. James Mansergh, was still too ill to attend their meetings; and they all very much regretted his absence from their midst that day.

Mr. A. L. Don seconded the motion.

Mr. Corbet Woodall fully agreed with the Chairman that just now it was not desirable to say much with regard to the visit he had the satisfaction of paying to South Africa in the autumn of last year. Certain matters were still under consideration; and so, in the first place, one could not say what was likely to be the issue of them, and, in the second place, it was not desirable to prophesy. As to the works of the Association, he found them in admirable order. Mr. Arnott continued to be one of the most energetic and capable managers they could possibly hope to have in charge of the technical side of their business; and Mr. Armour was equally good with regard to the office. The past year in South Africa had been even worse than the year preceding, which was one of very great depression. The anticipated revival after the war was absolutely missing. The depression was, in fact, so great that he was told—with reference to railway receipts—that it was necessary to go back as far as the seventies to find a parallel to the year 1903. Still, people were tolerably cheerful, and were anticipating that in a little while the time of fasting would be past, and better times would come. Unfortunately, one effect of the war had been to increase the cost upon all works' raw material; and the wicked extravagance with which expenditure was carried on in war time had demoralized Kaffir labour to a great extent, and had not only made the Kaffirs independent beyond what employers were accustomed to, but had induced, as a necessary consequence, strikes and inconveniences of that sort. The Directors were therefore doing their best to reduce the amount of labour there—a thing that three years ago they would not have thought likely to be a direction in which to look for the remunerative expenditure of capital. Regarding the towns he visited with a view to increasing the business of the Association, he found that there was a strong disposition in favour of electric lighting, and a sad want of knowledge, on the part of municipal authorities, of what had been done by gas lighting. In Johannesburg, he made an offer for the purchase of the gas-works which belonged to the Municipal Authority, and which they were not disposed then to seriously extend and cultivate; and that offer was still under consideration. If it succeeded, he thought they might look forward to doing a profitable business in Johannesburg. Concerning the position of the Association generally, he thought it might be of interest to the shareholders to know that in the last ten years the capital had increased by 81 per cent., but in the same period the business had increased by 185 per cent.—showing that while a considerable amount of money had been spent it had not been spent extravagantly. The price of gas had been reduced by 2s. 8d, per 1000 cubic feet, of which they had been able to save 8d. in the cost of dividend and interest. As the Chairman had said, they had had some fifteen months of reduced consumption; but they had now "turned the corner" in both Port Elizabeth and Grahamstown, where they had had in the past year an increase. His own feeling was that this was likely to continue in greater proportion. In Port Elizabeth they would shortly have to face electrical competition; but, profiting by the experience they had had elsewhere, he did not think the shareholders need be much afraid of the result of this. It might for a time injuriously affect their consumption, but before very long he believed its effect would be nullified by the greater advance of the use of gas for industrial and other purposes.

The motion was unanimously carried.

On the proposition of the Chairman, seconded by Mr. Henry Woodall, a dividend of 10 per cent. was declared (free of income-tax), less the interim payment of 4 per cent.

Proposed by the Chairman, and seconded by Mr. J. L. Cloudesley, Mr. H. Woodall, the retiring Director, was unanimously re elected.

The Chairman moved a hearty vote of thanks to the officials and their staffs, both in South Africa and in London.

Mr. G. C. Whiteley, in seconding from the body of shareholders, spoke in terms expressing how thorough were their feelings of obligation to their officials, especially in South Africa.

Mr. Corbet Woodall added that he was sure this expression from the shareholders would be very highly valued by the three chief officers in South Africa. The careful and minute interest they took in the affairs of the Association spoke strongly of their fidelity. He should like to say with regard to the reduced profit of the year, that this had been, as the Chairman had explained, largely due to the increased expenditure upon repairs and renewals. He was glad to say in this respect Mr. Arnott was entirely with the Directors, and was always careful to charge nothing against capital that could possibly and fairly be charged against the revenue of the year. The effect of this policy was seen in the figures he gave as to the reduction of the proportion of capital to business done. He hoped they would be able to continue on the same lines for many years to come. If they did, he was quite certain the success of the Association would be assured.

Cordial recognition was also made of the services of the Chairman and Directors.

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 578.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
500,000	10	Apl. 13	10½	Alliance & Dublin 10 p.c.	21—22	..	4 15 5
160,000	10	,,	7½	Do. 7 p.c.	14—15	..	5 0 0
200,000	5	May 12	6½	Bombay, Ltd.. . . .	6½—7*	..	4 12 10
140,000	5	,,	6½	Do. New, £4 paid	5—5½*	..	4 14 6
50,000	10	Mch. 15	14	Bourne- 10 p c. . .	29½—30½	..	4 11 10
251,810	10	,,	7	mouth Gas B 7 p.c. .	16½—17½	..	4 0 0
53,200	10	,,	6	and Water Pref. 6 p.c.	15½—16½	..	3 12 9
380,000	Stk.	Feb. 24	12	Brentford Consolidated	247—252	..	4 15 3
300,000	,,	,,	9	Do. New . . .	185—190	..	4 14 9
50,000	,,	,,	5	Do. 5 p.c. Pref. .	127—132	..	3 15 9
206,250	,,	Dec. 15	4	Do. 4 p.c. Deb. .	105—108	..	3 14 1
220,000	Stk.	Mch. 15	11	Brighton & Hove Orig.	223—228	..	4 16 6
246,320	,,	,,	8	Do. A. Ord. Stk. .	165—170	..	4 14 2
460,000	20	Mch. 30	10	British	40—41	..	4 17 7
100,000	Stk.	Feb. 24	6	Bromley, Ord. 5 p.c. .	118—123	..	4 17 7
165,700	,,	,,	4½	Do. do. 3½ p.c. .	90—94	..	4 15 9
500,000	10	May 12	7	Buenos Ayres (New) Ltd.	12—12½*	..	5 12 0
250,000	Stk.	Dec. 30	4	Do. 4 p.c. Deb. .	96—98	..	4 1 8
150,000	20	Mch. 15	8½	Cagliari, Ltd.	25—27	..	6 2 3
100,000	10	Sept. 29	10	Cape Town & Dis., Ltd.	17½—18	−½	5 11 1
100,000	10	Apl. 28	4½	Do. 4½ p.c Pref.. .	9½—10	..	4 10 0
50,000	50	May 2	6	Do. 6 p.c. 1st Mort.	52—54	..	5 11 1
50,000	Stk.	Dec. 30	4½	Do. 4½ p.c. Deb. Stk.	100—102	..	4 8 3
1,400,000	Stk.	Feb. 24	5/16	Commercial 4 p.c Stk. .	113—116	+1	4 9 8
560,000	,,	,,	5	Do. 3½ p.c. do. .	110—113	+1	4 8 6
450,000	,,	Dec. 15	3	Do. 3 p.c. Deb. Stk.	86—88	..	3 8 2
800,000	Stk.	,,	6½	Continental Union, Ltd.	112—115	..	5 13 1
200,000	,,	,,	7	Do. 7 p c Pref.	140—145	..	4 16 7
424,070	Stk.	Feb. 18	5½	Derby Con. Stk. . . .	123—125	..	—
55,000	,,	Jan. 3	4	Do. Deb. Stk. . . .	108—110	..	3 12 9
486,090	10	Jan. 27	11	European, Ltd. . . .	22—23	..	4 15 8
354,060	10	,,	11	Do. £7 10s. paid	15—16	..	5 3 2
15,243,200	Stk.	Feb. 10	4 4/16	Gas- 4 p.c. Ord. . .	99½—100½	+½	4 7 7
2,600,000	,,	,,	3½	light 3½ p.c. max. . .	92—94	..	3 14 6
3,799,735	,,	,,	4	and 4 p.c. Con. Pref.	109—112	..	3 11 5
4,193 975	,,	Dec. 15	3	Coke 3 p.c. Con. Deb.	90—92	..	3 5 3
258,740	Stk.	Mch. 15	5	Hastings & St. L. 3½ p.c.	100—103	..	4 17 1
70,000	10	Apl. 28	11	Hongkong & China, Ltd.	16½—17½	..	6 5 8
3,800,000	Stk.	May 12	10	Imperial Continental .	212—215*	−1	4 13 0
473,600	Stk.	Feb. 10	3½	Do. 3½ p.c. Deb. Red.	96—98	..	3 11 5
175,242	Stk.	Mch. 15	6	Lea Bridge Ord. 5 p.c. .	120—125	..	4 16 0
561,000	Stk.	Feb. 24	10	Liverpool United A . .	222—224	..	4 9 3
718,100	,,	,,	7	Do. do. B . .	164—166	..	4 4 4
306,083	Stk.	Dec. 30	4	L'rpool Unit'd Deb. Stk.	111—113	..	3 10 10
75,000	5	Dec. 15	5	Malta & Medn., Ltd. .	4¼—4¾	..	5 5 3
560,000	100	Apl. 1	5	Met. of 5 p.c. Deb..	101—103	..	4 17 1
250,000	100	,,	4½	Melbourne 4½ p.c. Deb.	101—103	..	4 17 1
541,920	20	Nov. 11	3½	Monte Video, Ltd. . .	11½—12½	..	5 12 0
1,565,892	Stk.	Feb. 24	4½	Newc'tle & G'tesh'd Con.	109—110	−1	4 4 1
406,625	Stk.	Dec. 30	3½	Do. 3½ p.c. Deb.	92—93	..	3 15 3
15,000	10	Feb. 24	10	North Middlesex 10 p.c.	19—20	..	5 0 0
52,940	1/	,,	7	Do. 7 p.c.	13—14	..	5 0 0
300,000	Stk.	May 12	8	Oriental, Ltd. . . .	145—148*	..	5 8 1
600,000	5	Mch. 30	7	Ottoman, Ltd. . .	6—6½	..	5 12 0
235,005	Stk.	—	6½	Plym'th & St'house 5 p.c.	—	..	—
398,490	5	Apl. 28	6	Primitiva Ord. . . .	5⅞—6⅛	..	4 16 0
796,980	5	Jan. 27	5	Do. 5 p.c. Pref. .	5⅛—5⅜	..	4 13 0
488,900	100	Dec. 1	4	Do. 4 p.c. Deb. .	96—98	..	4 1 8
851,070	10	Apl. 28	7	River Plate Ord. . . .	11½—12	−¼	5 16 8
300,000	Stk.	Dec. 30	4	Do. 4 p.c. Deb. .	97—99	..	4 0 10
250,000	10	Apl. 13	7	San Paulo, Ltd. . . .	12½—13	..	5 7 8
70,000	50	Jan. 3	5	Do. 5 p.c. Deb. .	52—54	..	4 12 7
135,000	Stk.	Mar. 15	10	Sheffield A	235—237	+1	4 4 5
209,984	,,	,,	10	Do. B	235—237	+1	4 4 5
523,498	,,	,,	10	Do. C	235—237	+1	4 4 5
123,998	Stk.	Mch. 30	5	Shrewsbury Ord. 5 p.c.	107—110	..	4 10 11
70,000	10	,,	11	South African	16—17	..	6 9 5
6,250,000	Stk.	Feb. 10	5½	South Met., 4 p.c. Ord.	127—129	..	4 5 3
1,832,700	,,	Jan. 13	3	Do. 3 p.c. Deb.	89—91	..	3 5 11
575,000	Stk.	Feb. 24	5½	S'th Suburb'n Ord. 5 p.c.	120—123	..	4 9 5
60,000	,,	,,	5	Do. 5 p.c. Pref. . .	122—127	..	3 18 9
112,533	,,	Jan. 13	5	Do. 5 p.c. Deb. Stk.	130—135	..	3 14 1
502,310	Stk.	May 12	5	Southampton Ord. . .	107—110*	..	4 10 11
87,950	,,	—	4	Do. 4 p.c. Deb.	—	..	—
120,000	Stk.	Feb. 24	6½	Tottenham A 5 p.c. .	125—128	..	4 17 8
338,020	,,	,,	4½	and B 3½ p.c. .	98—101	..	4 14 1
125,000	,,	Dec. 15	4	Edmonton 4 p.c. Deb.	107—110	..	3 12 9
182,380	10	,,	8	Tuscan, Ltd.	9¾—10¼	..	7 16 1
149,900	10	Jan. 3	5	Do. 5 p.c. Deb. Red.	102—104	..	4 16 2
30,000	Stk.	Feb. 24	7½	Wands- A 5 p.c. . .	163—168	..	4 12 3
255,636	,,	,,	6½	worth B 3½ p.c. . .	135—140	..	4 9 3
60,000	,,	,,	5 7/16	and C 3½ p.c. . .	114—116	..	4 13 6
57,564	,,	Dec. 30	3	Putney 3 p.c. Deb. Stk.	82—87	..	3 9 0
745,872	,,	Mch. 15	5	West Ham 5 p.c. Ord. .	102—104	..	4 16 2
185,000	,,	,,	5	Do. 5 p.c. Pref. . .	123—126	..	3 19 4
193,300	,,	Dec. 30	4	Do. 4 p.c. Deb. Stk.	105—110	..	3 12 9

Prices marked * are "Ex div."

METROPOLITAN WATER BOARD.

The Examination of Water.

The Fortnightly Meeting of the Board was held on Friday—Sir R. M. BEACHCROFT in the chair.

The Works and Stores Committee submitted a long report in regard to the obligations of the Board contained in the Metropolis Water Act, 1902, with respect to the examinations of water. In accordance with authority conferred upon the Committee by the Board in July last, arrangements were made with Sir William Crookes, Sir James Dewar, and Dr. Houston, in conjunction with the Chief Engineer (Mr. W. B. Bryan, M.Inst.C.E.), to report as to the steps which they might consider should be taken for discharging their obligations. These gentlemen had presented a joint and unanimous report containing a series of proposals. Having given them full consideration, the Committee submitted the following recommendations: "That it is desirable, as soon as practicable, to erect and equip a central laboratory for the purposes of section 25 of the Metropolis Water Act, 1902; and that the Works and Stores Committee be instructed, in consultation with the Director (if his appointment should be resolved upon), to report as to the best available site, and to submit plans and specifications for the building and its equipment, with an estimate of the cost thereof, with a plan of the site proposed for the building. That the estimate of £1000 to be submitted by the Finance Committee be approved, and that a Director of Water Examinations be appointed at a salary of £1000 per annum." The recommendations were agreed to.

On the recommendation of the Appeal and Assessment Committee, it was decided to appoint a Committee to consider the question of promoting a Bill next session providing for uniform scales of charges applicable throughout the limits of supply of the Board.

The Board had before them a statistical return relating to the supply for the month of April. It showed that the average daily supply was 203,965,000 gallons; the number of houses supplied, 1,021,732; and the total estimated population, 6,729,062. The mean supply of water per head per day was 30·31 gallons, compared with 31·67 gallons in April, 1904. The quantity of water in store at the end of the month was 6879 million gallons, including 3029 millions in the Staines reservoirs. There were 1785 new supplies laid on; and 9873 yards of new mains were laid. The number of fires in all the districts was 253; the largest number (91) being in the Southwark and Vauxhall district.

NEW WATER RESERVOIR FOR TORQUAY.

The members of the Torquay Town Council last Thursday paid a visit of inspection to the works in progress in connection with the new storage reservoir in the Trenchford Valley. The reservoir, which is being constructed under powers obtained in 1903, was begun the following February, and has proved a difficult and costly undertaking. In excavating the trench for the foundation of the embankment, a good deal of decomposed granite has been met with; and there have also appeared in the hard granite many large joints and crevices, besides a considerable quantity of water. The unfavourable nature of the ground has necessitated a good deal of additional excavation; while, owing to the inroads of water, constant pumping has been necessary. Mr. S. C. Chapman, the Corporation Water Engineer, is now of opinion that a satisfactory foundation has been reached; and one of the events of Thursday's visit was the actual commencement of the filling of the trench. In this ceremony the Mayor (Mr. J. Smerdon) and the Chairman of the Water Committee (Alderman E. P. Bovey) took part. In other directions, the work is making fair progress. About 22,000 cubic yards of the embankment has been put in, out of a total of 89,000 cubic yards; and the main culvert through which the pipes will pass through the dam is being constructed. The reservoir will have a capacity of 200 million gallons, an area of 30 acres, and a maximum depth of 50 feet. Alderman Bovey, in the course of a speech on the occasion, referred to the unexpected difficulties of the undertaking; and said that Mr. G. R. Strachan, M.Inst.C.E., the Consulting Engineer, had confirmed the opinion of Mr. Chapman as to the necessity of the excavation which had been carried out. The average depth of the trench was 36 feet, and the greatest depth 90 feet; while the original estimate was that an average depth of 25 feet would be sufficient. The Mayor congratulated the Water Committee and the Engineer on having reached the present stage of the work, and said he hoped it would now be carried out without further difficulty. They looked upon their watershed as second to none in the country; and when the reservoir was completed, they would have overcome all possible criticism with regard to storage.

Gas v. Electricity at Wandsworth.—At Wednesday's meeting of the Wandsworth Borough Council, the Highways Committee reported that they had received tenders for lighting High Street, Putney, throughout by various systems of high-power gas and by electric arc lamps. The Committee had decided in favour of gas, but did not see their way to accept any tender in its entirety. They recommended that ten of the existing lamps be removed, that ten new Lucas incandescent suspension lamps and one ordinary incandescent lamp be fixed in lieu thereof, and that four of the existing lamps should be shifted in position, at an estimated cost of £214. It was stated that the total annual cost of lighting the High Street under the present system was £89; and the total estimated annual cost under the scheme recommended would be £188. After a discussion, in which the various speakers confined themselves to criticisms of the extent of the proposed extensions, the report was referred back, with instructions to bring up a more comprehensive scheme. It is worthy of remark that during the debate no exception was taken to the Committee's choice of gas as an illuminant.

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NEW EDITION of VALVE CATALOGUE SENT on APPLICATION.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

The action by Messrs. James Muir and Son, Limited, of Calton Hill Brewery, Edinburgh, against the Edinburgh and Leith Gas Commissioners, with reference to the alleged pollution of a brewery well, comes before Lord Ardwall in the Court of Session for proof on Tuesday. The pursuers claim £10,000 as damages, and they also conclude for a statutory penalty of £200, and a further statutory penalty of £20 a day during the continuance of the alleged offence. What is complained of is that the Gas Commissioners, in the dismantling of their works in New Street, Edinburgh, allowed oily tar to escape and leak into the ground, and that it has found its way into one of the wells. The Commissioners reply that the water in the well has not been fouled by anything which they have done. In the preparation of the case some of the leading scientists of the day have been consulted, from which we may expect a stiff contest. Four days have been allowed for the hearing of the case.

Mr. John Jack, who has for many years been Chief Inspector of Gas-Meters, in the employment of the Corporation of Edinburgh, is about to retire from active service, receiving a pension. For the vacant post 42 applications have been received. These have been cut down to seven. The salary offered is £200 a year.

The Strathaven Gas Company, Limited, have paid a dividend at the rate of 5 per cent., and have reduced the price of gas by 5d. per 1000 cubic feet, making it 3s. 9d. It was reported at the annual meeting of shareholders on Tuesday that, following upon the recent exhibition of gas appliances of Messrs. R. & A. Main, Limited, about forty stoves had been sent out.

I do not know that many railway signals are lighted at night by means of gas; and so the information contained in this paragraph will be of less interest to gas managers than it might have been. It is to the effect that when a new railway between Edinburgh and Leith was opened a few years ago, the signal-lamps were lighted by electricity; and it is now intimated that the experiment has been so satisfactory that the North British Railway Company are about to extend the installation, beginning with the Waverley Station. There is, it is stated, no need for lampmen, for the signalman can, in his cabin, switch on and off the signals he has charge of. With a lampman on a big round, the lamps often burned for hours longer than was necessary. By the new system it is claimed that there is a saving in stores, wages, and lamp-room accommodation. Another saving is in the abolition of winding gear on the signal-posts. Current is supplied by the Edinburgh Corporation.

A very important piece of work in connection with the Talla water scheme was performed by the Edinburgh and District Water Trustees last Saturday, in the closing of the valve at the new reservoir, the construction of which has occupied nearly ten years. A great embankment of earth, clay, and stone has been built across the valley, going 40 feet below the bed of the stream, and rising 90 feet above it. It is proposed to impound water to a depth of 79 feet. When the reservoir is full, its surface area will be 300 acres in extent, and its length will be 2½ miles. The capacity will be 2750 million gallons. The valley narrows very considerably, and makes a sharp turn from direct north and south to south-east. It was at first intended to construct the embankment at the bend; but, upon reflection, it was decided to place it a considerable distance down the valley, the reason for this being that, at the narrow part, the embankment would have had to stand the full force of the water lashing upon it in times of storm from the south. As it is placed, the wash will expend most of its force upon the hillside, at the bend; and the clear run of water upon the embankment does not exceed half-a-mile. An unusual method of drawing off the water has been adopted. Instead of the pipe-track passing through the embankment, it has been placed in a tunnel which has been cut through the side of the hill. The regulating valve is placed at the reservoir end of this tunnel; and it was this which was operated upon last Saturday. It is set so as to allow the compensation water—5 million gallons per day—to pass. The lowering of it to that point was performed by Sir Andrew M'Donald, in presence of almost the whole body of the Trustees. In the course of about four hours, water had gathered in the reservoir to a depth of 7 feet; and yesterday it was reported to be 13 feet deep. It is anticipated that it will take at least six months to fill the reservoir; but an effort is to be made to have the water turned on by Sept. 28, which will be the tenth anniversary of the start of the construction of the reservoir. It is the intention at present that the turning on of the water will be performed by the Lord Provost of Edinburgh and the Provost of Leith. Last Saturday, after the ceremony, Mr. John Best, the Contractor for the reservoir, presented to Sir Andrew M'Donald and Mr. T. Wood, of Portobello, the Conveners of Committees, silver rose bowls, with views of the Talla works and suitable inscriptions, as mementoes of the proceedings of the day. A luncheon followed, after which there were a few complimentary speeches. While the Trustees were on the spot, they directed their attention to a proposal by the Engineer (Mr. W. A. Tait) to the effect that it might be advisable to construct a breakwater of masonry, 100 feet or thereby in length, to protect the western end of the embankment against the heavy wash when the wind is blowing down the valley. The Trustees resolved to ask Mr. G. H. Hill, their Consulting Engineer, his opinion upon the subject. Mr. Hill visited the Talla on Tuesday, and reported that, in his view, a breakwater was quite unnecessary, the embankment having been so placed as to reduce all danger to a minimum.

The new Busbie Muir reservoir, constructed to provide an additional supply of water for the burgh of Ardrossan, was formally opened yesterday, by Provost Young. The Contractor presented the Provost with a silver fruit bowl, as a souvenir of the occasion. The reservoir is constructed to hold between 70 and 80 million gallons. It has cost upwards of £15,000.

CARBURETTED WATER-GAS APPARATUS

Merrifield—Westcott—Pearson Patents.

The Economical Gas Apparatus Construction Co., Ltd.

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W. H. PEARSON, Junr., Deputy-Chairman.
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CARBURETTED WATER-GAS ENGINEERS.

The above Company have erected since 1893, or are now erecting, their Universal Type of Carburetted Water-Gas Plant at the following Gas-Works:—

	Cub. Ft. Daily.		Cub. Ft. Daily.		Cub. Ft. Daily.
BLACKBURN	1,250,000	ST. CATHERINES (Remodelled)	250,000	TONBRIDGE	300,000
WINDSOR ST. WORKS, BIRMINGHAM	2,000,000	KINGSTON, PA.	125,000	STRETFORD	500,000
SALTLEY WORKS, BIRMINGHAM	2,000,000	PETERBOROUGH, ONT.	250,000	OLDBURY	300,000
COLCHESTER	300,000	WILKESBARRE, PA.	750,000	TODMORDEN	500,000
BIRKENHEAD	2,250,000	ST. CATHERINES (2nd Cont.)	250,000	SALTLEY, BIRMINGHAM (Third Contract)	2,000,000
SWINDON (New Swindon Gas Co.)	120,000	BUFFALO, N.Y.	2,000,000	YORK (Second Contract)	750,000
SALTLEY, BIRMINGHAM (Second Contract)	2,000,000	WINNIPEG, MAN.	500,000	ROCHESTER (Second Contract)	500,000
WINDSOR ST., BIRMINGHAM (Second Contract)	2,000,000	COLCHESTER (Second Contract)	300,000	NEWPORT (MON.)	250,000
HALIFAX	1,000,000	YORK	750,000	TOKIO, JAPAN	1,000,000
TORONTO	250,000	ROCHESTER	500,000	PERNAMBUCO (Brazil)	125,000
OTTAWA	250,000	KINGSTON, ONT.	300,000	MALTON	150,000
LINDSAY (Remodelled)	125,000	CRYSTAL PALACE DISTRICT	2,000,000	DULUTH, MINN. (2nd Cont.)	300,000
MONTREAL	500,000	DULUTH, MINN.	300,000	BROCKVILLE (ONT.)	250,000
TORONTO (Second Contract Remodelled)	2,000,000	CATERHAM	150,000	SMETHWICK	500,000
BELLEVILLE	250,000	LEICESTER	2,000,000	GRAVESEND	300,000
OTTAWA (Second Contract)	250,000	ENSCHEDE (HOLLAND)	150,000	NEWPORT MON. (Second Contract)	250,000
BRANTFORD (Remodelled)	200,000	BUENOS AYRES (RIVER PLATE CO.)	700,000	TORONTO (Third Contract)	750,000
		BURNLEY	1,500,000	TORONTO (Fourth Contract)	1,000,000
		KINGSTON-ON-THAMES	1,750,000	MONTREAL, ONT. (2nd Cont.)	1,800,000
		ACCRINGTON	500,000	HAMILTON, ONT.	400,000

LEEDS, 1,800,000 C. Ft. LEICESTER (2nd Cont.), 1,000,000 C. Ft. NEWCASTLE-ON-TYNE, 1,800,000 C. Ft.

AND IN ADDITION, 7,900,000 CUBIC FEET DAILY; also Coal-Gas Plants at NELSON, B.C., CHATHAM, BERLIN, NAPANEE, OWEN SOUND, CALGARY, and WINNIPEG.

CURRENT SALES OF GAS PRODUCTS.

Week ending May 27.

The position of pitch in London has been affected to some extent by the reported sale at 30s. net for prompt delivery. It is even stated that a slight further quantity would be sold at the same figure. This, however, has absolutely no influence on forward business; makers being very firm in their ideas. Moreover, important business has been done on the Continent over a long period at better prices. The lowest prompt price for London ordinary creosote is 1¾d. net, with a good demand. 60° crude carbolic acid has been done both at 1s. 9¼d. and 1s. 9⅜d. net; but quotations are rather wide. There have been several transactions in 90 per cent. benzol all at 8⅜d. net, with a steady market. Other products are unchanged. Sulphate of ammonia continues to be briskly inquired for; £12 17s. 6d. on Beckton terms being makers' lowest price, and 1s. 3d. under this figure has been bid and refused for (say) May and June.

LIVERPOOL, *May 27.*

Sulphate of Ammonia.

Demand has again been well sustained, and prices have been fully maintained, the closing quotations being £12 12s. 6d. per ton f.o.b. Hull, and £12 16s. 3d. to £12 17s. 6d. per ton f.o.b. Liverpool and Leith. The Continent has been quiet; but Spanish and Colonial orders have been sufficient to absorb current production. There is also good inquiry for June, but in this position makers are not inclined to sell below prompt prices. For the forward positions makers' views are for the most part quite above those of buyers, and no important first-hand business has been reported. There has, however, been speculative selling abroad at about the equivalent of £12 7s. 6d. per ton f.o.b.; and this about represents buyers' ideas of value for July-December and October-March delivery.

Nitrate of Soda.

This article has been rather quiet, and the closing local quotations are 11s. 1½d. and 11s. 3d. per cwt., for ordinary and refined qualities respectively.

LONDON, *May 27.*

Tar Products.

There is very little alteration to advise in markets generally; and there has not been very much business doing. For 90 per cent. benzol, London makers are again quoting 8¾d.–9d. for early delivery. Consumers, however, decline at present to pay anything over 8¾d. for May-June delivery; and it is reported that business has been done at this price delivered to consumers' works in the North. In 50-90 per cent., there is rather a better inquiry from the Continent for early shipment; but makers do not care to offer this quality, as it pays better to produce toluol, for which there is a very good inquiry at 8d. per gallon. There is, however, very little offering for prompt delivery, and makers do not care to offer forward just at present. The demand for solvent naphtha continues fairly good for home consumption; one or two small parcels of 90 per cent. at 160° having been sold during the past week. As regards the special qualities, prices are decidedly firmer; and there is a strong demand for June delivery. There is absolutely nothing fresh to advise in anthracene. In creosote, business for prompt delivery is decidedly limited, especially in London. But there is reported to be a very good inquiry for October-December for export to America; and no doubt shipment of this will be arranged in bulk, which, of course, would be a considerable relief to London producers. In Yorkshire, a small business is again reported at 1¼d. for prompt delivery; while in Liverpool and Manchester there is a fair quantity offering for early delivery. Markets in carbolic acid remain in the same position; but there is really very little business doing, as distillers are not disposed to reduce their price, while consumers decline to pay anything over 1s. 9d. for 60's at present. There is certainly, however, more inquiry for July-December; but manufacturers do not care to offer over this period except at a considerable improvement on existing prices. In crystals, there is a fairly good business doing, especially in 34-35 per cent., several small parcels of which are reported to have been sold during the past week. Pitch continues decidedly quiet, especially for prompt delivery, for which there are still sellers at 30s. f.o.b. London; while on the East Coast 29s. and 29s. 6d. has been accepted in several instances. There is still a considerable quantity offering in the Manchester and Liverpool district; makers being evidently anxious to clear out stocks before the hot weather sets in. The South Wales consumers appear to be out of the market at present, having evidently secured their supplies for some little time forward; while in Belgium the difficulty in obtaining small coals still restricts the output of briquettes.

The average values during the week were: Tar, 17s. 6d. to 21s. 6d. Pitch, London, 30s.; east coast, 28s. 6d. to 29s.; west coast, 27s. to 28s. Benzol, 90 per cent., 8¼d. to 8¾d.; 50-90 per cent., 7½d. to 8d. Toluol, 8d. Crude naphtha, 3d.; solvent naphtha, 8¼d. to 8½d.; heavy naphtha, 10d. to 10½d. Creosote, London, 1 15/16d.; North, 1¼d. Heavy oils, 2d. to 2¼d. Carbolic acid, 60 per cent., 1s. 9¼d. to 1s. 9½d. Refined naphthalene, £4 to £8; salts, 12s. 6d. to 14s. Anthracene, "A" quality, 1¼d. to 1⅝d.; "B" quality, unsaleable.

Sulphate of Ammonia.

The market remains in about the same position, and the demand continues good for prompt delivery. The position of Beckton is unchanged; their price being still nominally £12 16s. 3d. to £12 17s. 6d. for May-June shipment. In Hull, business has again been done at £12 10s. for prompt; and there is more inquiry for June shipment. In Leith, makers still quote £12 17s. 6d. for early shipment; but the market is rather quiet and there is no business of importance to report. In Liverpool, there is still a very strong demand for early shipment; and prices rule about £12 15s. for immediate delivery.

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The Carburettor is inexpensive, easily fixed, and entirely supersedes the use of Cannel.

Dealers in Benzol, Carburine, and all other Naphthas and Oils suitable for the Enrichment or Production of Gas.

For Prices and full Particulars, apply to

THE GAS LIGHTING IMPROVEMENT COMPANY, LIMITED,

18, DEVONSHIRE STREET, BISHOPSGATE, LONDON, E.C.

COAL TRADE REPORTS.

Lancashire Coal Trade.

Some good gas coal contracts, it is said, are still in the market. The demand for slack is as firm as ever, and quantities of this class of coal are being imported from Yorkshire. Coal for coke-making purposes is also finding its way into this district. House coals are a slow market. Coal for shipping is in steady request. Prices show little variation from the quotations given in our last issue. With a comparatively large number of new cotton spinning mills and weaving sheds in course of erection, the outlook for engine fuel is most encouraging.

Northern Coal Trade.

The coal trade has been decidedly quieter in the last few days; there being exports that are much smaller than are usual at this time of the year, when the Baltic trade is very full generally. This year the trade is not so brisk. Steam coals are dull at about 9s. 1½d. to 9s. 3d. per ton f.o.b. for best Northumbrian sorts, second-class steams are 8s. 3d. per ton, and steam smalls are firm, being rather scarce, at from 4s. 9d. to 5s. 6d. per ton f.o.b. As to the gas coal trade, there is a fair demand for the season; but the home demand is naturally limited at this time, and the collieries are only well employed that ship a large part of their output. The demand from abroad for gas coals seems to increase. Prices of Durham gas coal vary from 7s. 9d. to 8s. 3d. per ton f.o.b., with a higher price for one or two preferred qualities. There is no settlement of any contract of importance this week; and for the smaller ones, good Durham gas coals command the prices of last year. Coke is steady; and gas coke, being now in lower production, is rather firmer relatively—the f.o.b. price being from 12s. to 12s. 6d. per ton, though some deliveries are being made at higher prices.

Scotch Coal Trade.

There is an improvement in the shipping branch of the trade, by reason of which better time is being got by the miners. The demand for home consumption is steady. The prices quoted are: Main 7s. 3d. to 7s. 6d. per ton f.o.b. Glasgow, ell 8s. 3d. to 9s., and splint 8s. 3d. to 8s. 9d. The shipments for the week amounted to 252,628 tons—an increase of 12,172 tons upon the previous week, and of 17,532 tons upon the corresponding week of last year. For the year to date, the total shipments have been 4,406,547 tons—an increase of 338,605 tons upon the same period of 1904.

The Richmond Gas Stove and Meter Company, Limited, have recently held successful gas-stove exhibitions at Accrington and Blackpool, and have also co-operated with the Greenock and Stockport Corporation Gas Departments in similar exhibitions.

TRADE NOTES.

Little's Hot-Coke and Gravity Bucket Conveyors.

A contract has been placed by the Greenock Gas Committee for complete coke-conveying plant, to be installed at the Inchgreen works. There will be two hot-coke conveyors delivering into a gravity bucket conveyor, which in turn will discharge into large storage hoppers; special provision being made by telescopic raising and lowering shoots for loading the hopper without breaking the coke. Two screens are included, as well as engines and gearing. It was after making several visits of inspection that the Committee decided to instal A. Little's patent hot-coke conveyor and gravity bucket conveyor.

Some New Advertisements.

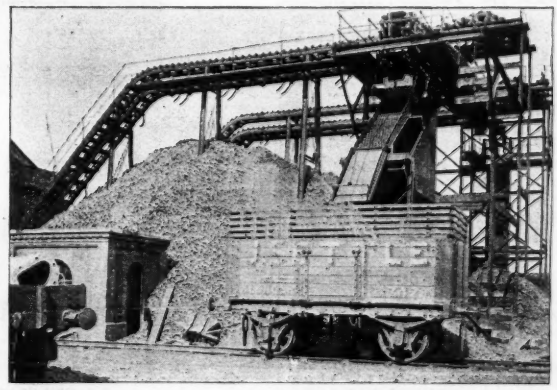
Messrs. John Wright and Co. are certainly to be complimented upon the taste and "catchiness" that characterize the advertising matter with which they circularize their present and prospective customers. Their latest effort in this direction is an excellently got-up leaflet calling attention to the firm's schemes for developing gas sales without capital outlay. The wording and illustration on the front page "The main lines are broad and clear," are well calculated to arrest attention, if only for the reason that the most prominent words—the "Main" lines—are suggestive of a competitor. Messrs. George Bray and Co. have taken advantage of the present popularity of pictorial postcards to issue one with a view to advertising their acetylene burner department, and more especially their patent "Elta" burner. This they claim to be in every respect the best acetylene burner in the world, and the only one that can be turned low without carbonizing. Yet another advertisement which claims brief mention in this note is an attractive showcard which is now being distributed by Messrs. Ashmore, Benson, Pease, and Co. This, by means of numerous illustrations, conveys an excellent idea of the range of plant which the firm manufacture for gas-works purposes in their foundry, machine shop, and constructional departments, which have recently been thoroughly re-organized and brought up-to-date.

Tees Valley Water Board.—The accounts of the Tees Valley Water Board for the six months ending Feb. 14 show a capital expenditure during this period of £67,829, bringing the total cost of the undertaking up to £2,467,737. The revenue account shows the income to have been £51,463, or an increase of £1167 compared with the preceding half year. The expenditure on revenue account amounted to £10,098, or a decrease of £47. The balance carried to net revenue account was £41,366. There remains a balance on the net revenue account of £63,797, including a sum of £22,569 brought forward from the previous half year. Of this amount, £39,000 was paid to the Corporations interested during the six months, leaving the sum of £24,797 to be carried forward.

A NOVELTY!

HOT COKE CONVEYORS.

Archd. Little's Patent HOT and COLD COKE CONVEYORS fitted with



W. T. Holland's Patent DUST PROOF ROLLERS AND BRACKETS, The "KEYSTONE" Patent, on Conveyors.

On the above Installation Coke is taken from Retorts and put into stock or direct (over screens) into waggons. The Conveyors **AUTOMATICALLY PICK UP FROM STOCK** and discharge into waggons when desired.

SOLE MAKERS:

NEW CONVEYOR CO., LTD., SMETHWICK, BIRMINGHAM.

Sale of Water Stock at Luton.—The Directors of the Luton Water Company recently offered for sale by tender £2500 of new consolidated ordinary stock, bearing a maximum dividend of 4 per cent. per annum. It was intimated that a lower price than £113 per £100 of stock would not be accepted; and we learn that the average price realized was 10s. more than the reserve.

Concession to Users of Gas for Power at Plymouth.—The Plymouth and Stonehouse Gas Company announce a reduction in the price of gas to users of engines. The price for all purposes in the Company's district is 1s. 9d. per 1000 cubic feet—a rate at which it has, with one brief interval, stood for many years. Users of gas-engines are now to be charged 1s. 6d. per 1000 cubic feet; the price to other consumers remaining for the present unchanged.

Devonport Corporation Gas Undertaking.—It is announced that the working of the Devonport gas undertaking last year resulted in a gross profit of £16,738. After payment of the interest and sinking fund charges, there is a balance of £2106, which the Gas Committee propose to add to the depreciation and reserve fund. Mr. J. W. Buckley, the new Manager, has taken control of the works; but for the present he is also giving the necessary attention to those at Falmouth.

Gas Profits and the Rates at Bolton.—On the balance-sheet of the Bolton Gas and Lighting Committee coming before the General Purposes Committee recently, a recommendation was made that the Committee should provide a further sum of not less than £6000 in aid of the rates; and the Gas Committee subsequently met and agreed to carry out the suggestion. The Committee originally voted £16,068 for the assistance of the rates; and the total is now increased to £22,068. Last year the amount voted by the Committee was £20,000.

Issue of Additional Stock by the Bristol Gas Company.—Messrs. G. Nichols, Howes, Young, Alder, and Co. have been instructed by the Bristol Gas Company to sell by auction, on the 8th prox., as recently announced in our advertisement columns, £20,000 of general capital stock, entitled to a maximum dividend of 5 per cent., and £10,000 of new 4 per cent. perpetual debenture stock. The stocks will be issued in lots of £100 each or less, so that consumers and small capitalists may obtain a holding in the Company, who have not only paid maximum dividends for nearly forty years, but possess an accumulated reserve fund which stands at £111,295.

Birmingham Corporation and the Gas-Fitting Business.—A letter was recently addressed by a Mr. W. Beal, of Birmingham, to Mr. Joseph Chamberlain, calling his attention to the fact that the Corporation Gas Department was extending the fitting business to the detriment of local tradesmen. The following reply (signed "J. Wilson") has now been received: "I am desired by Mr. Chamberlain to acknowledge the receipt of your letter, and to say at the time when the Gas Companies were bought by the Corporation the former were doing a certain amount of trade in connection with their own fittings, and this was continued by the Corporation with the rest of the business. But there was no intention of enlarging it, or of carrying it on with any view to profit."

The Control of the Lighting of Rio de Janeiro.—The "Financial News" gives the following quotation from a New York despatch, "Dr. F. S. Pearson, who sailed for Brussels, to secure, if possible: the control of the Gas Companies of Rio de Janeiro, which are now owned in Brussels, for the Rio de Janeiro Light, Power, and Tramway Company, cables that he has successfully closed the deal. All the Lighting Companies of the city will now be turned over to his Company, which gives them a monopoly of the light, heat, power, and street-railway business in the Brazilian capital. One of the first steps will be the utilization of electricity in place of gas. At the present time, there is no electricity in this city of over 800,000 inhabitants. It is understood that between $6,000,000 and $7,000,000 was paid for the control of these foreign-owned Gas Companies."

Additional Capital for the Ilford Gas and Tendring Hundred Water Companies.—At the Mart, Tokenhouse Yard, last Tuesday, Mr. Alfred Richards offered for sale, in compliance with instructions received from Directors, £10,000 of ordinary "C" stock and £5000 of 4 per cent. perpetual debenture stock of the Ilford Gas Company, and 800 "A" £10 shares in the Tendring Hundred Water Company. In the case of the first-named issue of capital, he acted in conjunction with Mr. W. Ashmole, of Ilford. The "C" stock ranks for a standard dividend of 5 per cent., subject to the sliding-scale; but since the first issue of this stock in 1900, the dividend paid upon it has been at the rate of 6 per cent. per annum. The new issue was all sold at from £114 to £116 per £100; and the debenture stock was placed at par. The Water Company's "A" shares rank for a maximum dividend of 8 per cent.—the last having been at the rate of 4½ per cent; and those offered on Tuesday fetched £10 5s. and £10 7s. 6d. each, *cum div.* as from the 1st of July.

Portsmouth Water Company.—At the ordinary half-yearly general meeting of this Company last Thursday, the Chairman (Mr. W. Grant, J.P.), in moving the adoption of the report, the principal features of which have been already noticed, said that on no previous occasion had the progress of the Company been so marked as during the past six months; the increase on the rental being £1322, and the decrease on the management £1440, while the balance to be carried forward was £3065 above that at the corresponding period last year. There were circumstances which prevented the payment of back-dividends on the present occasion; but the Directors were fully assured that they would be forthcoming at a future date. Colonel C. L. Owen seconded the motion, which was carried unanimously. A resolution to the effect that the Directors' remuneration should be raised to 1250 guineas per annum gave rise to a long discussion, and, on a show of hands, it was declared to have been carried. The Chairman's ruling was, however, disputed, and a poll was taken; the result being that 35 votes were given in its favour, and 25 against it. The result of the poll was subsequently published in a local paper; the figures being as follows: In favour of the resolution, 3367; against it, 659. The Directors did not vote upon the question, or use the proxies (carrying 3458 votes) entrusted to them.

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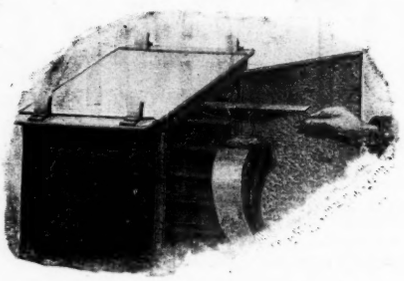
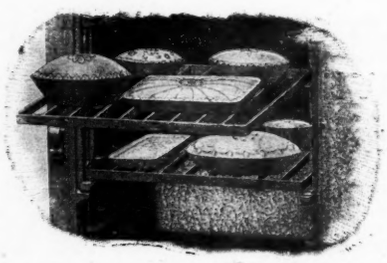
EMBODIES MANY IMPORTANT IMPROVEMENTS.

HINGED HOT-PLATE.



SLIDING MEAT-HOOK.



SELF-LOCKING GRID SHELF.

PARKINSON AND W. & B. COWAN, LTD.,
(*Parkinson Branch*),
COTTAGE LANE, CITY ROAD, LONDON.
BELL BARN ROAD, BIRMINGHAM.

Fatal Accident at the Croydon Gas-Works.—An inquest has been held on a man named Donovan, who met with a fatal accident while employed at the Croydon Gas-Works. According to the evidence, deceased was engaged in wheeling a barrow of coke across a plank bridge—which was over 4 feet wide, and the same distance from the ground—to tip into the furnace, when he fell with the barrow on to the brick flooring beneath. Deceased was dragging the barrow along the bridge, which inclined one in seven. Witnesses stated that there was no danger in crossing the bridge; and the Jury returned a verdict of "Accidental death."

Plymouth Water Supply.—Owing to the continued increase in the consumption of water, the Water Committee of the Plymouth Corporation have had under consideration the question of laying a new pipe-line from the storage reservoir at Burrator to the first of the service reservoirs at Roborough. As an alternative, the question of again utilizing the the old leat which formed the original source of supply has been considered. The leat has not been employed since the pipe-line was laid, nearly ten years ago, and portions of it near and through the town have been out of use for a much longer period. In order to test its present condition, the Committee last week had the water run into it for several days, and cleaned out the length of several miles between Burrator and Roborough. This having been done, the pipes were closed, and the leat was utilized as an experiment for carrying the whole service. The Committee's opinion was that it is an efficient alternative method of supply; and the Town Council will probably be recommended to sanction such repairs as are necessary to put it in thoroughly useful condition again. Between Burrator and the Roborough reservoir the course of the leat is mainly through moor and common land, and there is no great rock of contamination, though, of course, the old objection of the loss by leakage and evaporation during the conveyance of the water through an open channel still remains.

The profits of the Batley Corporation Gas-Works for the past year amounted to £3400, despite the fact that the price of gas to consumers had been reduced by 2d. per 1000 cubic feet.

The British Solar Gas-Mantle Works, Limited, has been registered, with a capital of £2500 in £1 shares, to carry on the business of manufacturers of, and dealers in, incandescent gas mantles, &c. There is to be no initial public issue.

The Arundel Gas Company have placed an order with Messrs. Robert Dempster and Sons, Limited, of Elland, for a new retort-bench, tower scrubber, &c. The work has to be carried out under the supervision of the Company's Manager, Mr. W. C. Dawson.

The Dutch steamer *Heemskerck* arrived off Maryport recently from Rotterdam with 1500 tons of German coke for Messrs. Cammell, Laird, and Co. This is stated to be the first foreign coke imported into the North-west of England, and the purchase of it is supposed to be the ironmasters' reply to the action of the Railway Companies, who have withdrawn the rebate on the carriage of Durham coke. Last half year the Maryport and Carlisle Railway Company paid ¼ per cent. less dividend, mainly owing to the concession on the carriage of coke, and the Companies contend that the traffic will now bear the full freight. The ironmasters reply that they must have cheap carriage in order to hold their own with competitive districts.

Messrs. John Wright and Co., of Birmingham and London, have been very busy recently holding exhibitions of their well-known gas appliances in various parts of the kingdom. Last week two were opened—namely, at Scarborough and Appleby. At the former, lectures on cookery were given by Mrs. Charles Laughton, M.C.A., and at the latter by Miss Margaret Lovell, L.C.A. The spell of summer weather lately experienced has given a fillip to the demand for gas-cooking apparatus; and Messrs. John Wright and Co. have had to deal with an exceptional "rush" for their "Eureka" cookers. For this week, they announce exhibitions at Scalby, Dungarven, and Pitlochry, at all of which places there will be a special display of "Eureka" gas cooking and heating appliances. Cookery lectures will also be given by first-rate demonstrators.

At the annual meeting of Meters Limited last Tuesday, Alderman Miles, in moving the adoption of the report (*ante*, p. 463), said that, taken in conjunction with the lamentable state of trade during the past twelve months, the results of the year's working were very satisfactory. Competition in their line was now very keen indeed; but they had nevertheless managed to maintain a satisfactory state of affairs. He also referred to certain experiments which the Company had been conducting in connection with a water-meter, and said they hoped to be able in a month or two to put a thoroughly good adjustment of this kind on the market. The placing of £10,000 to the reserve fund was the result of their desire to continue to proceed with caution and to prepare for all eventualities. The reserve fund now stood at £45,000. The report was adopted, and a dividend of 6 per cent. on the ordinary shares was declared.

In previous issues of the "JOURNAL," reference has been made to the formation last year of the Northern District Gas Companies' Cricket League, the President of which is Mr. A. E. Broadberry, of Tottenham. We learn from the Hon. Secretary and Treasurer (Mr. C. O. Banks) that the President attended a very successful meeting of the League on the 17th inst., and presented to the Council the shield promised by him which is to be competed for by the different clubs. The main object of the League is to bring together the employees of the various Gas Companies; and the honour of holding the trophy shield will stimulate friendly rivalry. According to the official handbook which Mr. Banks has compiled, the fixtures extend from the 6th inst. to the 19th of August; and there appears to be every prospect of some good cricket being played between these dates. In his introductory remarks, Mr. Banks states that every effort will be made to present the winners with medals; but he very properly deprecates mere "pot-hunting" and "medal-grabbing" in the League. He urges all to play their games fairly and squarely, like true sportsmen. This will give an added pleasure and satisfaction to their wins, and soften disappointments at losses.

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COOKERS

METERS

PENDANTS

PIPING etc.

LABOUR SUPERVISION etc.

WE

Provide and fix Complete Installations, including Stove, Meter, and Fittings at an Agreed Price: Payment spread over a number of years, if desired.

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——GAS COMPANY.

"I have no hesitation in saying that the whole of this work (fitting up about 1000 Automatic Installations, providing in each case the Meter, Cooker, Fittings, Piping, and also all necessary labour) has been carried out with the utmost despatch, and to the entire satisfaction of my Company and myself. Your foreman has shown the greatest possible intelligence in dealing with consumers, and his unfailing courtesy at all times has created the very best impression amongst our consumers.

"Any doubts I may have had as to the desirability of placing our Installation work outside our own staff have proved groundless, and had I the work to do over again I should most certainly, after the experience I have had, place it in your hands for execution.

"I am glad to inform you that my Directors have decided to hand over to you a new District for fitting up Installations, and I shall be glad if you will commence this work at once."

**Name on application.*

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COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

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SATURATORS and all LEAD and TIMBER WORK in Connection with Sulphate Plants.
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PAINTING Work for all kinds of Gas- Works Plant undertaken by contract or otherwise.
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SULPHATE PLANTS—See Advt. in this week's issue.
METHANE-HYDROGEN PLANT—See Advt. in next week's issue.

"VITERNUS" METALLIC PAINT FOR GAS-WORKS PLANT.
JOHN E. WILLIAMS AND CO.,
LOWER MOSS LANE,
MANCHESTER, S.W.
Telegrams: "ENAMEL." National Telephone 1759.

THE Applicants for the Situation advertised under No. 4389 are THANKED, and informed that the Appointment HAS NOW BEEN MADE.

ENGINEER calling on Gas Engineers all over England, and having good Connection, wants other AGENCIES.
Address, No. 4399, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

DRAUGHTSMEN.
WANTED, at once, Two Experienced DRAUGHTSMEN
Apply, stating Age and Experience, to the GILBERT LITTLE COMPANY, LIMITED, Conveyor and Elevator Specialists, Smethwick, BIRMINGHAM.

ADVERTISER (Age 23) requires situation as CLERK or BOOK-KEEPER. Thoroughly Experienced in Water and Gas Company's Books and General Accountancy. Shorthand. Typist. Best References.
Address No. 4398, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED by the Sheppey Gas Com- pany, Sheerness, for about five Months, a CLERK OF WORKS, to supervise the laying of about 4 miles of 8-inch and 10-inch Main. None but competent men need apply.
Applications, with Testimonials and Wages required, to Mr. W. J. CARPENTER, Assoc.M.Inst.C.E, Gas-Works, GREAT YARMOUTH.

CITY OF WATERFORD GAS COMPANY.
FOREMAN Fitter wanted to Superin- tend Outdoor Fitters' Work and Interview and Advise Consumers. Must be well up in interior house fitting, including Cookers, Heaters, Geysers, &c., Main and Servicing, and all kinds of Incandescent Lighting, Public and Private.
Good opening for Smart, Intelligent, and Capable Man; four men having already vacated this position to become Gas Managers.
Wages £2 per week.
Apply, stating Experience, Age, &c., to Mr. J. G. TOOMS, Manager, Gas-Works, WATERFORD, in own handwriting.

OXIDE OF IRON.
(NATURAL.)
BALE & CHURCH will be pleased to send Quotations and Samples on application.
SPENT OXIDE PURCHASED.
BALE'S FIRE CEMENT for all Retort and Furnace work.
PAINT for Gasholders, Purifiers, &c.
5, CROOKED LANE, LONDON, E.C.

SULPHURIC ACID.

SPECIALLY prepared for the Manu- facture of SULPHATE OF AMMONIA.
SPENCER, CHAPMAN, AND MESSEL, LIMITED, 36, Mark Lane, LONDON, E.C. Works: SILVERTOWN.
Telegrams: "HYDROCHLORIC, LONDON."
Telephone: 341, AVENUE.

WANTED, a Main and Service Layer Good Character.
Send all Particulars, by letter, to Mr. LANE, Gas Works, AYLESBURY, Bucks.

WANTED, a Young Man with good Technical Training as ASSISTANT ENGINEER for a Gas-Works in Buenos Ayres.
State Qualifications, Age, and Salary required to SECRETARY, River Plate Gas Company, Limited, 10 & 11, Austin Friars, LONDON, E.C.

GAS STOVE TRADE.
WANTED, a young man with Ex- perience of Exhibitions and General Sales. Good prospects for suitable man.
State Age and full Particulars of Experience and qualifications to No. 4400, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

ILFORD GAS COMPANY.
SHOW-Room Attendant and Clerk Wanted (not under 25), used to the business and to receive payment of accounts.
Apply, by letter only, stating Age, Experience, if Single or Married, Salary required, and when able to commence duties, to H. W. ASHMOLE, Secretary, Ilford Gas Company, Cranbrook Road, ILFORD.

WANTED a First Class practical Man to Take Charge of Gas and Water Distribution, including Plumbing, and Main and Service laying. Good Mechanic or Plumber, able to control men, prepare Estimates, &c. Wages 35s. to 40s. per week, with House free.
Three Testimonials and application in own handwriting by June 5, to No. 4401, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED at once by the Swindon United Gas Company, a SHOW-ROOM ATTENDANT. Applicants must be thoroughly conversant with all the Latest Methods of Lighting, Heating, and Cooking by Gas, and be able to Advise consumers. A knowledge of Electric Lighting, as also Experience in a similar position, will be considered an advantage. Wages 30s. per week, including House and Gas.
Applications, with *copies* of not more than Three Testimonials, to be sent in on or before Tuesday, June 6, 1905, to
JOHN J. JERVIS,
Secretary.

ALDERSHOT GAS AND WATER COMPANY.
APPLICATIONS are invited for the position of SENIOR SLOT INSPECTOR and COLLECTOR to the above Company. Candidates must have had previous Experience, and be capable of Assisting in the Office when required. Wages 30s. per week.
Applications, in own handwriting, accompanied by *copies* of not more than Three recent Testimonials, to be sent to the undersigned, not later than Monday June 4, 1905.
R. W. EDWARDS,
Secretary and General Manager.
Victoria Road, Aldershot.

WANTED, a Second-Hand Holmes WASHER, capable of dealing with 100,000 cubic feet of Gas per Twelve hours.
State Price and where to be seen to No. 4396, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

OLD Meters Purchased. Wet or Dry, any size, in Truckloads only at per Ton. State quantity.
Also all kinds of Apparatus bought for Cash.
FIRTH BLAKELEY AND CO., Thornhill, DEWSBURY.

ROBERT DEMPSTER & SONS, Ltd., Contractor for Complete CARBONIZING PLANTS and every description of GAS APPARATUS and ELEVATING and CONVEYING PLANT, ROSE MOUNT IRON-WORKS, ELLAND.

REDDITCH GAS COMPANY.

CONDENSER for Sale (water cooled), faced joints. First-Class Condition. Capacity 250,000 per day.
Particulars, &c., from A. E. LAYTON, Manager.

NEW Gasholder, 40 ft. diameter by 12 ft. deep, with Steel Standards; also new STEEL TANK to contain same.
Write J. WRIGHT, 181, Queen Victoria Street, LONDON, E.C.

GAS PLANT for Sale—I can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters. Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. Compare Prices and Particulars before ordering elsewhere.
J. F. BLAKELEY, Gas Engineer, Thornhill, DEWSBURY.

EAST DEREHAM URBAN DISTRICT COUNCIL.

TENDERS are invited for 1600 Tons of screened GAS COAL or NUTS.
Particulars and Form of Tender to be had on application to the undersigned, to whom sealed Tenders, endorsed "Coals," must be sent on or before the 6th day of June, 1905.

(Signed) B. H. VORES,
Clerk to East Dereham
Urban District Council.

May 22, 1905.

TENDERS FOR GAS COAL.

THE Corporation Gas Committee of Stoke-upon-Trent invite TENDERS for the supply of 14,000 Tons of GAS COAL.
Specification and Form of Tender may be obtained on application to the undersigned, or at the Gas Offices.
Tenders to be sent in not later than Twelve o'clock noon on the 14th day of June, 1905, addressed to F. Geen, Esq., J.P., Chairman of Gas Committee, Stoke-upon-Trent, and endorsed "Tender for Gas Coal."

WM. PRINCE,
Engineer and Manager.

Gas Offices, Stoke-upon-Trent,
May 17, 1905.

TENDERS FOR GAS COAL.

THE Directors of the Newmarket Gas Company invite TENDERS for the supply of 5000 Tons of best screened GAS COAL during the Ten Months ending the 30th of June, 1906.
Tenders, stating Price per Ton delivered free at Newmarket Station as required, to be sent to the undersigned on or before the 10th of June next, from whom any further Particulars may be obtained.
The Directors do not bind themselves to accept the lowest or any Tender.

By order,
J. H. TROUGHTON,
Secretary and Manager.

Gas-Works, Newmarket,
May 27, 1905.

URBAN DISTRICT COUNCIL OF LYMM.

THE above Council are prepared to re- ceive TENDERS for the supply of CANNEL and best screened GAS COAL, to be delivered at their Gas-Works in Lymm, for a term of Twelve Months from the 1st day of July, 1905.
The probable quantities required will be about 100 Tons of Cannel and about 1800 Tons of Gas Coal, which must be freshly wrought, well screened, and free from Sulphurous Pyrites and other objectionable matter; but the Council reserve the right of increasing or decreasing the quantities named.
The person whose Tender is accepted will be required to enter into an agreement with the Council for the due performance of his Contract.
Sealed Tenders, stating price per ton delivered alongside the Works, to be sent to the undersigned on or before the 21st day of June, 1905, and endorsed "Coal Tender."
The Council do not bind themselves to accept the lowest or any Tender.
Forms of Tender are not supplied.
Further Particulars may be had on application to the Gas Manager, Mr. W. L. Donaldson.

W. MULLARD,
Clerk.

Council Offices, Lymm, Cheshire,
May 26, 1905.

TAR AND AMMONIACAL LIQUOR.

THE Lymm Urban District Council are prepared to receive TENDERS for the purchase of the surplus TAR and AMMONIACAL LIQUOR made at their Gas-Works, for a term of one year from the first day of July, 1905 (or for such longer term as may be contracted for with the consent of the Council).
The tar and Liquor will be delivered free into Contractor's boat on the Bridgwater Canal.
Tenders, to be sent to the undersigned on or before the 21st day of June, 1905, endorsed "Tar."
The purchaser will be required to enter into an agreement with the Council for the due performance of his Contract.
The Council do not bind themselves to accept the highest or any Tender.
Forms of Tender are not supplied.
Further Particulars may be had on application to the Gas Manager, Mr. W. L. Donaldson.

W. MULLARD,
Clerk.

Council Offices, Lymm, Cheshire.
May 26, 1905.

TO COLLIERY PROPRIETORS.

THE Corporation of Haverfordwest invite TENDERS for the supply of about 1400 Tons of Double-Screened GAS COAL of the very best quality, and about 300 Tons of STEAM COAL, to be delivered at the Haverfordwest Railway Station, or at the Gas-Works Quay, Haverfordwest, by Water communication, in quantities as required by the Gas Manager during the Year commencing the 1st of September, 1905.
Tenders by Monday, the 19th day of June, 1905.
Particulars of

R. T. P. WILLIAMS,
Town Clerk.

Council Chamber,
Haverfordwest, May 23, 1905.

CITY OF CARLISLE.

THE Carlisle Gas Committee are pre- pared to receive TENDERS for the COAL and CANNEL required at their Works during One Year from the 1st of July next.
Tenders, endorsed "Coal," and addressed to the Chairman of the Gas Committee, to be delivered at the Office of the Town Clerk not later than June 5, 1905.
Form of Tender and other Particulars may be had on application to the undersigned.

By order,
W. J. SMITH, B.Sc.,
Engineer and General Manager.

Gas-Works, Carlisle,
May 18, 1905.

CITY OF CARLISLE.

THE Carlisle Gas Committee are pre- pared to receive TENDERS for the FIRE-CLAY, RETORTS, FIRE-BRICKS, &c., required at their Works during One Year from the 1st of July next.
Tenders, endorsed "Fire-Clay," and addressed to the Chairman of the Gas Committee, to be delivered at the Office of the Town Clerk not later than June 5, 1905.
Form of Tender, giving quantities, &c., will be forwarded on application.

By order,
W. J. SMITH, B.Sc.,
Engineer and General Manager.

Gas-Works, Carlisle,
May 18, 1905.

COUNTY BOROUGH OF HALIFAX.

THE Gas-Works Committee of the Halifax Corporation invite TENDERS for the supply of 75,000 Tons of GAS COAL, to be supplied in such quantities as may from time to time be determined by the Gas-Works Committee, during the Year ending June 30, 1906.
Forms of Tender and further Information may be obtained on application to Mr. J. Wilkinson, F.C.S., Engineer, Gas-Works, Halifax.
Tenders, endorsed "Coal," must be sent to the undersigned not later than Twelve o'clock noon on Wednesday, June 7, 1905.
The Committee do not bind themselves to accept the lowest or any Tender.

By order,
KEIGHLEY WALTON,
Town Clerk.

ROCHESTER, CHATHAM, AND STROOD GAS-LIGHT COMPANY.

SUPPLY OF GAS COAL.

THE Directors invite Tenders for the supply of about 45,000 Tons of GAS COAL, to be delivered between the 1st day of July, 1905, and the 30th of June, 1906.
Further Particulars with Form of Contract and Tender may be had on application; and sealed Tenders, marked "Coal," are to be delivered to me at these Offices not later than noon of Wednesday, the 7th of June, 1905.

J. M. VEEVERS,
Engineer and General Manager.

Gas Offices, Rochester,
May 25, 1905.

ROCHESTER, CHATHAM, AND STROOD GAS-LIGHT COMPANY.

GAS OIL.

THE Directors invite Tenders for the supply of about 1,000,000 Gallons of OIL suitable for the Manufacture of Carburetted Water Gas, to be delivered free by barge at the Gas-Works, Rochester, and Gillingham, Kent, in such quantities and at such times as may be required during the period ending the 30th of June, 1906, or thereabouts.
Sealed Tenders, endorsed "Gas Oil," with Analysis, &c., to be delivered to me not later than noon of Wednesday, the 7th of June, 1905.

J. M. VEEVERS,
Engineer and General Manager.

Gas Offices, Rochester,
May 25, 1905.

ROCHESTER, CHATHAM, AND STROOD GAS-LIGHT COMPANY.

TAR.

THE Directors are prepared to receive TENDERS for TAR to be produced at their Works at Rochester and Gillingham for One Year commencing July the 1st next.
The quantity will be about 300,000 Gallons, and will include Carburetted Water-Gas Tar.
Further Particulars, with Form of Tender and Contract, may be had on application; and no Tender will be considered unless on the Form supplied by this Company.
Sealed Tenders, endorsed "Tar," must be delivered to me at these Offices not later than noon of Wednesday, June 7, 1905.
The Directors do not undertake to accept the highest or any offer, and security for the due fulfilment of the Contract must be given if required.

J. M. VEEVERS,
Engineer and General Manager.

Gas Offices, Rochester,
May 25, 1905.

HEXHAM GAS COMPANY.

TENDERS FOR GAS COAL.

THE Hexham Gas Company are pre- pared to receive TENDERS for the supply of about 4500 Tons of GAS COAL (unscreened) to be delivered as may be directed during the Year ending June 30, 1906.
Tenders, endorsed "Coal," to be forwarded to the undersigned not later than Tuesday, June 13, 1905.

HERBERT LEES,
Engineer and Secretary.

Gas Offices, Hexham,
May 26, 1905.

MORLEY CORPORATION.

(GAS DEPARTMENT.)

TENDERS FOR COAL.

THE Gas Committee of the above Cor- poration are prepared to receive TENDERS for the supply of the GAS COAL required by them for a period of Twelve Months.
Forms of Tender may be obtained on application to Mr. H. J. Hemingway, Town Hall, Morley.
Endorsed Tenders to be sent to the undersigned, not later than Tuesday, the 13th of June.

FRED. THACKRAY,
Town Clerk.

Town Hall, Morley.
May 27, 1905.

PONTYPRIDD URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

THE Gas Committee of the above Council are prepared to receive TENDERS for:—
1.—The supply of 150 Tons of OXIDE OF IRON for Gas Purification.
2.—The purchase of 150 Tons of SPENT OXIDE (More or less).
Forms of Tender and Specification may be obtained from Mr. Edward Jones, Gas Engineer, Gas-Works, Treforest.
Sealed Tenders, endorsed "Oxide," must be received by me not later than noon on June 6, 1905.

J. COLENSO JONES,
Clerk to the Council.

District Council Offices,
Pontypridd, May 13, 1905.

COALVILLE URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

THE above Council invite Tenders for the supply of 1600 Tons of GAS COAL and washed NUTS delivered in Waggons to Coalville (Midland Station) between July 1, 1905, and June 30, 1906, in such quantities monthly as required.
The Council reserve the right to divide the quantity.
The lowest of any Tender not necessarily accepted.
Tenders, endorsed "Coal Tender," addressed to the Chairman of Gas Committee, Gas Office, Whitwick, Nr. Leicester, on or before June 13, 1905, to be sent on Contractors' own Form.

JOS. W. EAGLES,
Engineer and Manager.

Gas-Works, Whitwick,
May 17, 1905.

BANGOR CORPORATION.

THE Gas Committee invite Tenders for the supply of 4000 Tons of best screened GAS COAL or NUTS, delivered free on rail, Bangor Station (L. and N.W. Railway), between August 1, 1905, and July 31, 1906, in such quantities, monthly, as required.
The Gas Committee reserve the right to divide the quantity.
The lowest or any Tender not necessarily accepted.
Forms of Tender may be had from the undersigned.
Tenders must be on the prescribed Forms and accompanied by Analysis, and addressed to the Chairman of the Gas Committee, Gas Office, Bangor, N. Wales, on or before June 14, 1905.

JOHN SMITH,
Manager.

Gas-Works, Bangor, N.W.
May 24, 1905.

CLACTON URBAN DISTRICT COUNCIL.

THE above Council are prepared to re- ceive TENDERS for the supply and delivery of about 50 Tons of British CAST-IRON PIPES and CONNECTIONS.
Copy of the Specification and Form of Tender may be obtained from the Council's Engineer, Mr. Sydney Francis, Assoc.M.Inst.M.E., Town Hall, Clacton-on-Sea.
Sealed Tenders, endorsed "Tender for Pipes," to be delivered to the undersigned not later than noon on Wednesday, the 7th of June, 1905.
The Council do not bind themselves to accept the lowest or any Tender.

GEO. T. LEWIS,
Clerk to the Council.

Town Hall Buildings,
Clacton-on-Sea, May 25, 1905.

SHREWSBURY GASLIGHT COMPANY.

TENDERS FOR COAL.

THE Directors of the Shrewsbury Gaslight Company invite TENDERS for the supply of about 16,000 Tons of Screened GAS COALS or Washed GAS NUTS, to be delivered free at the Great Western or London and North-Western Goods Yard, Shrewsbury, during the Year commencing July 1, 1905, and ending June 30, 1906.
The Directors reserve to themselves the right to divide the quantity into two or more Contracts, and do not bind themselves to accept the lowest or any Tender.
Tenders must be made on Forms (containing further Particulars) which may be obtained on application at the Company's Works, or by post, and must be sent to the undersigned on or before the 17th day of June, 1905.

By order,
WM. BELTON, Assoc.M.Inst.C.E.,
Secretary and Manager.

Gas-Works, Shrewsbury,
May 16, 1905.

TAUNTON GASLIGHT AND COKE COMPANY.

THE Directors of the Taunton Gaslight and Coke Company are prepared to receive TENDERS for the supply of COAL over One or Two Years, commencing the 1st of July next.

Particulars may be obtained from

A. EDWARDS,
Secretary and Manager.

May 24, 1905.

SULPHATE OF AMMONIA.

THE Taunton Gaslight and Coke Company have for disposal about Fourteen Tons of good grey SULPHATE OF AMMONIA, offers for which may be made to

A. EDWARDS,
Secretary and Manager.

Gas-Works, Taunton,
May 27, 1905.

CITY OF BIRMINGHAM.

(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the supply of 300,000 Tons of GAS COAL and 5000 Tons of CANNEL to the Corporation Gas-Works during the Year ending the 30th day of June, 1906.

Forms of Tender, returnable on or before Monday, the 5th day of June next, can be obtained on application at my office.

G. HAMPTON BARBER,
Secretary.

Council House, Birmingham,
May 25, 1905.

TANK AND HOLDER.

THE Sedgley Urban District Council are prepared to receive TENDERS for a BRICK GASHOLDER TANK to be erected at their Gas-Works, Lower Gornal; also for a SPIRAL-GUIDED GASHOLDER for the same Works.

Particulars may be obtained on application to the Manager.

Separate and sealed Tenders, marked "Tank" or "Holder" as the case may be, must reach me on or before the 6th of June, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

By order,
JOSEPH SMITH,
Clerk of the Council.

Offices: High Holborn,
Sedgley, May 20, 1905.

COUNTY BOROUGH OF STOCKPORT.

AMMONIACAL LIQUOR.

THE Gas and Electricity Committee invite TENDERS for the Surplus AMMONIACAL LIQUOR made by them, such Tenders to be made on a Sliding-scale basis.

Particulars as to Quantity and Conditions of Contract on application to the Engineer, S. Meunier, from whom Forms of Tender can be obtained.

Tenders, endorsed "Ammoniacal Liquor," must be addressed to the Chairman of the Gas and Electricity Department, care of the Town Clerk, Stockport, and be delivered on or before June 7, 1905.

The Committee do not bind themselves to accept the lowest or any Tender.

By order,
ROBERT HYDE,
Town Clerk.

Stockport,
May 26, 1905.

PETERBOROUGH GAS COMPANY.

TENDERS FOR COAL AND SULPHURIC ACID.

THE Directors of the above Company invite TENDERS for the following—viz., Best quality of Through and Through GAS COAL for One Year, stating price per Ton in Waggons at Pit, Railway Rate to Peterborough, and Waggon hire to Peterborough.

Also for the supply of about 120 Tons (more or less) of SULPHURIC ACID (for Sulphate Making), the same to be delivered in carboys carriage free to Peterborough as required during the Twelve Months from July 1, 1905, to June 30, 1906.

Tenders to be sent in by the 19th of June, 1905, endorsed "Coal" or "Sulphuric Acid," and addressed to the Chairman of the Company, Gas-Works, Peterborough.

The Directors do not bind themselves to accept the lowest or any Tender.

Special Tender Forms are not provided.

JOHN BARTON,
Secretary and Manager.

Peterborough,
May 26, 1905.

URBAN DISTRICT COUNCIL OF HORNCASTLE.

(GAS DEPARTMENT.)

CONTRACT FOR GAS COAL.

THE Council are prepared to receive TENDERS for the supply of from 600 to 1800 Tons (Railway weight) of Best Screened Silkstone GAS COALS and GAS NUTS, to be delivered at Horncastle Station during the Year ending June 30, 1906, in such quantities and at such times as the Council may from time to time direct.

The Coal must be delivered in a dry condition, free from hards, smudge, dirt, shale, pyrites, or other impurities.

Sealed Tenders, marked "Tenders for Gas Coal," must be sent to me, the undersigned, on or before the 19th day of June next.

The Council do not bind themselves to accept the lowest or any Tender.

The firm whose Tender is accepted will be required to enter into the usual Contract for due delivery of the Coal, and to give security for the due performance of such Contract.

Dated this 18th day of May, 1905.

R. W. CLITHEROW,
Clerk.

The Court House, Horncastle.

TENDERS FOR GAS COAL.

THE Directors of the Leamington Priors Gas Company are prepared to receive TENDERS for the supply of GAS COAL required by them during Twelve Months from the 1st of July next.

Particulars and Forms of Quotation may be obtained from the undersigned.

Tenders must be sent in on or before Wednesday the 21st of June.

THOMAS BERRIDGE,
Engineer and Secretary.

COUNTY BOROUGH OF OLDHAM.

THE Gas-Works Committee invite TENDERS for the TAR to be produced at their different Gas Stations for a period of One Year, commencing the 1st of July next.

The yearly make of Tar is about 7000 Tons.

Particulars and Forms of Tender can be obtained on application to Mr. Arthur Andrew, Gas and Water Offices, Oldham, to whom Tenders are to be sent on or before Tuesday, June 13, 1905.

J. H. HALLSWORTH,
Town Clerk.

Oldham, May 19, 1905.

SEVENOAKS GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors of the Sevenoaks Gas Company invite TENDERS for 8000 Tons of GAS COAL (Durham or Yorkshire preferred) to be delivered at the Company's Siding, Bat and Ball Station, South Eastern and Chatham Railway, Sevenoaks, Kent, for Twelve Months ending June 30, 1906.

Tenders must be sent in by not later than Tuesday, June 6 next, addressed to the Chairman, Wm. Henry Cronk, Esq., 88, High Street, Sevenoaks.

Further Particulars may be obtained from the undersigned.

HENRY HOW,
Secretary.

Gas Office, Sevenoaks,
May 27, 1905.

TENDERS FOR COAL.

THE Directors of the Town of Dudley Gaslight Company are prepared to receive TENDERS for the supply of about 15,000 Tons of GAS COAL or NUTS, to be delivered at the London and North Railways or Great Western Railway Sidings, Dudley, or the Great Western Railway Siding, Netherton, in such quantities as may be required, from the 1st of July next to the 30th of June, 1906.

Sealed Tenders, addressed to the Chairman, and endorsed "Tender for Coal," to be sent in not later than the 5th of June next.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right to divide the contract between two or more firms.

By order,
T. E. STILLARD,
Secretary.

Gas-Works, Dudley,
May 24, 1905.

KIDSGROVE GASLIGHT COMPANY.

COALS.

TENDERS are invited for the supply of about 3500 Tons of GAS COAL in such quantities as may be required, delivered on Canal alongside the Company's coal store, during the Twelve Months ending June 30, 1906.

TAR AND LIQUOR.

Tenders are invited for the Purchase of the surplus TAR and LIQUOR produced during the Twelve Months ending June 30, 1906, delivered in Canal boats only alongside Company's works.

The Directors do not bind themselves to accept the lowest or any Tender.

No Special Form of Tender provided.

Tenders to be sealed, marked, and delivered not later than June 15, 1905.

JAMES BEECH,
Manager and Secretary.

COUNTY BOROUGH OF BURY.

TENDERS FOR GAS COAL.

THE Gas Committee are prepared to receive TENDERS for the supply of—

40,000 Tons of GAS COAL.
500 ,, BURGY (more or less).
300 ,, HOUSE COAL (more or less).

Forms of Tender and Conditions of Contract may be obtained on application to Mr. H. Simmonds, Engineer and Manager, Gas-Works, Bury.

Tenders, endorsed "Gas Coal," to be addressed to the Chairman of the Gas Committee, Town Clerk's Office, Bank Street, Bury, and delivered not later than Saturday, the 10th day of June next.

JOHN HASLAM,
Town Clerk.

Municipal Offices, Bank Street,
Bury, May 24, 1905.

GUILDFORD GASLIGHT AND COKE COMPANY.

TO TAR DISTILLERS.

THE Directors of the above Company are prepared to receive TENDERS for the surplus Coal Gas TAR and Carburetted Water Gas TAR, separately or mixed, produced by the above Company, for the Year ending June 30, 1906. Coal Carbonized about 12,000 Tons per Annum. All Tenders to state the price per Cask of 40 Gallons.

Cartage to and from the Railway Station, Guildford, free. All empties to be provided by Contractor.

Tenders, endorsed "Tar," to be sent to F. F. Smallpeice, Esq., Chairman of the Gas Company, Guildford, on or before Wednesday, June 14, 1905.

By order,
WILLIAM TITLEY,
Secretary.

Gas Offices, Guildford,
May 20, 1905.

NORTHWICH GAS COMPANY.

THE Directors of the Northwich Gas Company invite TENDERS for the supply of about 6500 Tons of GAS COAL during the Year ending June 30, 1906.

Full Particulars and printed Forms of Tender may be had on application to the undersigned.

Tenders, endorsed "Coal," are to be sent in, addressed to the Chairman, by Thursday, June 8, 1905.

SAML. S. MELLOR,
Manager and Secretary.

Gas-Works, Northwich,
May 18, 1905.

TENDERS FOR STEEL TANK AND GASHOLDER.

THE Cwmbran and Pontnewydd Gas Company, Limited, are prepared to receive TENDERS for the supply and erection of a STEEL TANK and GASHOLDER, 50 feet diameter, prepared for telescoping.

Particulars from the undersigned, to whom Tenders must be sent on or before Saturday, June 10.

T. H. WHITE,
Manager.

Gas-Works,
Cwmbran, R.S.O., Mon.

TRAMORE PUBLIC HEALTH ACT COMMITTEE.

WATERFORD RURAL DISTRICT COUNCIL No. 1.

TRAMORE GAS-WORKS.

SCREENED GAS COALS WANTED.

THE above-named Committee will, at a meeting to be held at Tramore, on Thursday, the 1st of June, prox., entertain TENDERS for the supply of 230 Tons of Colliery or Double Screened GAS COAL, to be delivered, ex-ship (Waterford) carriage free, into Store at Tramore, in one Lot of 230 Tons, or two Lots of 115 Tons each. First Lot to be delivered before the 15th of July, prox., and the Second Lot within six months.

Tenders to specify description of Coal.

Twechar Gas Coal, Broughton, Silkstone, or Ravensworth Pelaw Coal preferred; and state price c.i.f. in Waterford. Colliery Certificate of origin required.

The Committee do not bind themselves to accept the lowest or any Tender.

Tenders to be addressed to William Gallwey, Esq., J.P., Tramore, Chairman of the Committee.

By order.
ED. DOYLE,
Secretary.

Tramore, Co. Waterford.
May 20, 1905.

EDINBURGH AND LEITH CORPORATIONS' GAS COMMISSIONERS.

GRANTON WORKS.

THE Commissioners are prepared to receive TENDERS for the Construction of an INCLINED RETORT CARBONIZING PLANT to the Design, Specification, and Schedule of Quantities prepared by their Engineer.

A copy of the Specification and Schedule of Quantities may be obtained by written application to Mr. W. R. Herring, M.Inst.C.E., Chief Engineer and Manager, New Street Works, Edinburgh, enclosing a deposit of £10 10s., which the Commissioners undertake to return upon receipt of a *bonâ-fide* Tender upon the Form provided and undetached from the Specification and Schedule of Quantities.

Detailed Drawings may be inspected by appointment at the Engineer's Office any time on or after the 31st inst.

Sealed and endorsed ("Tender for Inclined Retort Carbonizing Plant") Tenders must be delivered on or before Ten a.m. on the 26th of June, 1905, addressed to the undersigned.

The Commissioners do not bind themselves to accept the lowest or any Tender.

JAMES M'G. JACK,
Clerk.

25, Waterloo Place, Edinburgh,
May 26, 1905.

SUTTON-IN-ASHFIELD URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

TENDERS FOR GAS COAL, CANNEL, AND LIME.
TENDERS FOR COKE, TAR, AND AMMONIACAL LIQUOR.

COAL.

THE Gas Committee of the above Council are prepared to receive TENDERS for the supply of 500 Tons of CANNEL, and 4500 Tons of well-screened GAS COAL, to be free from Shale and Pyrites, and to be delivered at the Town Stations (Midland or Great Northern Railways), Sutton-in-Ashfield, in such quantities as the Manager shall from time to time direct between July 1, 1905, and June 30, 1906.

LIME.

Also for the supply of about 200 Tons of LIME, to be delivered at either of the above Railway Stations, in such quantities as the Manager shall from time to time direct between July 1, 1905, and June 30, 1906. The Lime is to be hand picked, and clear from refuse and ashes.

COKE, TAR, AND LIQUOR.

TENDERS are invited for the COKE and Surplus TAR and AMMONIACAL LIQUOR produced at their Works from July 1, 1905, to June 30, 1906, to be delivered in Purchaser's Tank-Waggons at the Midland or Great Northern Railway Stations, Sutton-in-Ashfield.

Tenders for Coal to state price per Ton of 20 cwt. at the Works or above Railway Stations.

No Tender Forms provided.

The Committee do not bind themselves to accept the lowest or any Tender.

Tenders, endorsed, to be addressed as under so as to arrive not later than the 5th day of June, 1905.

By order,
JOHN D. FIDLER,
Clerk.

Council Offices, Sutton-in-Ashfield.
May 26, 1905.

LURGAN GASLIGHT AND CHEMICAL COMPANY, LIMITED.

THE Directors invite Tenders for the supply of 3500 Tons of best quality screened GAS COAL, delivered into the Works at Lurgan, or placed on Lighters or on Rail at Belfast.

The Coal must be delivered in such quantities and at such times as the Directors may fix. Each Cargo to be accompanied by a Certificate as to place of origin.

Tenders (no Special Form in use), accompanied by reference to Gas-Works using the Coal offered, should reach me not later than Monday, June 5, 1905, at 10.30 o'clock, a.m.

The Directors do not bind themselves to accept the lowest or any Tender.

FRED. W. MAGAHAN,
Secretary.

Gas-Works, Lurgan,
May 3, 1905.

BUXTON URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

TAR AND AMMONIACAL LIQUOR.

THE Gas Committee invite Tenders for the purchase of the Surplus TAR and the whole of the AMMONIACAL LIQUOR which is produced, and delivered into purchasers' Tank-waggons at the Gas-Works Siding, Midland Railway, Buxton, during the Twelve Months ending June 30, 1906.

Forms of Tender may be obtained from Mr. H. Barker, Gas Engineer, Town Hall, Buxton.

Sealed Tenders, endorsed "Tar" or "Liquor," are to be delivered to the undersigned on or before Saturday, June 10, 1905.

The Council do not bind themselves to accept any Tender.

JOSIAH TAYLOR,
Clerk.

Town Hall, Buxton,
May 22, 1905.

BOROUGH OF CONGLETON.

(GAS DEPARTMENT.)

THE Gas Committee are prepared to receive TENDERS for the following:—

1.—EXHAUSTER and COMBINED ENGINE on same Bed-Plate, with Bye-Pass Valve and Regulator.
2.—Overhead Cast-Iron WATER-CISTERN and GIRDERS.
3.—CONDENSING PLANT.

Conditions and Particulars can be obtained from the undersigned.

Sealed Tenders, endorsed "Exhauster," "Cistern," or "Condenser" respectively, to be delivered at the Office of E. A. Plant, Esq., Town Clerk, Congleton, not later than Saturday, the 3rd of June, 1905.

The lowest or any Tender not necessarily accepted.

J. SMITH,
Engineer and Manager.

Gas-Works, Congleton,
May 12, 1905.

PAIGNTON GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors of the Paignton Gas Company are prepared to receive TENDERS for the supply of 4000 Tons about (or such other quantity as may be agreed on) of best approved GAS COALS, to be delivered in such monthly quantities as may be required by the Company.

Tenders to state the price of the Coal delivered at Paignton Station, Great Western Railway, free of all Charges.

Tender Forms are not issued.

The Directors do not bind themselves to accept the lowest or any Tender.

Further Particulars may be obtained on application to Mr. C. G. Dawson, the Company's Manager.

Sealed Tenders, endorsed "Tender for Coal," specifying the description and quality of Coal, to be sent on or before the 10th day of June, addressed to the undersigned at the Gas Offices, 1a, Victoria Street, Paignton.

F. W. PUDDICOMBE,
Secretary.

Paignton, May 9, 1905.

WEYMOUTH CONSUMERS' GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors of the above Company invite TENDERS for the supply of about 11,000 Tons of GAS COAL for One Year ending June 30, 1906, in such quantities as may be required by the Company.

Tenders to state the price f.o.b. or f.o.r. Weymouth.

Further Particulars may be obtained of the undersigned.

Tenders to be sent to the undersigned not later than Monday, June 12, 1905.

The Directors reserve to themselves the right to accept the whole or any portion of any quantity offered, and do not bind themselves to accept the lowest or any Tender.

DOUGLAS F. COLSON,
Engineer and Manager.

HEBDEN BRIDGE AND MYTHOLMROYD GAS BOARD.

THE above Gas Board are prepared to receive TENDERS for the supply of GAS COAL, about 7000 Tons, to be delivered free into the Gas Board's Railway Sidings (L. & Y. Station), Hebden Bridge, in such quantities as they may require during the next Twelve Months.

Forms of Tender and any further Particulars may be had on application to E. J. Wellens, Manager.

Tenders, endorsed "Gas Coal," and addressed to Jas. Simpson, Esq., Chairman, Gas Board Offices, Gas-Works, Hebden Bridge, must be delivered by noon on Friday, June 2, 1905.

The Committee do not bind themselves to accept the lowest or any Tender.

By order,
R. CRABTREE,
Clerk to Gas Board.

May 18, 1905.

SALISBURY GASLIGHT AND COKE COMPANY.

TENDERS are invited for 1000 to 4000 Tons of GAS COAL delivered f.o.r. Salisbury, as required over the ensuing Twelve Months.

Tenders to be sent, on or before the 13th of June, to N. H. HUMPHRYS, Gas-Works, SALISBURY,

URBAN DISTRICT COUNCIL OF STOURBRIDGE.

(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the supply of about 17,000 Tons of good, screened GAS COAL delivered on their Gas-Works.

Forms of Tender may be had on application to the undersigned, and only Offers on these Forms will be considered.

Tenders, endorsed "Gas Coal," addressed to the Chairman of the Gas Committee, to be sent to me at the Gas-Works, Stourbridge, on or before Tuesday, June 6, 1905.

The lowest or any Tender not necessarily accepted.

By order of the Committee,
W. NORTH,
Engineer and Manager.

Stourbridge Gas-Works,
May 19, 1905.

URBAN DISTRICT COUNCIL OF STOURBRIDGE.

(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the purchase of their surplus TAR during the Twelve Months ending June 30, 1906.

Tenders, endorsed "Tar," and addressed to the Chairman of the Gas Committee, to be sent to me on or before Tuesday, June 6, 1905.

The highest or any Tender not necessarily accepted.

By order of the Committee,
W. NORTH,
Engineer and Manager.

Stourbridge Gas-Works,
May 19, 1905.

DERBY GASLIGHT AND COKE COMPANY.

ISSUE OF £8000 ORDINARY (CONSOLIDATED) STOCK.

THE Directors of the above Company have instructed

Messrs. J. and W. HEATHCOTE

to offer for SALE by AUCTION, at the COMPANY'S OFFICES, Friar Gate, Derby, on WEDNESDAY, the 14th day of June, 1905, at Twelve o'clock at noon precisely, subject to such conditions as shall be then produced:

£8000 ORDINARY (Consolidated) STOCK
IN THE
DERBY GASLIGHT AND COKE COMPANY,
in Lots, to the highest bidder at a premium.

The Stock will be sold in Lots of £100 each, nominal value; and the premiums will be payable at the Sale.

The nominal purchase money for the Stock will be payable on the 1st of July, 1905.

Further Particulars and Conditions of Sale may be had on application to the undersigned, or of the AUCTIONEERS, Exchange Street, Derby.

H. BULLIVANT,
Secretary.

Gas Offices, Derby,
May, 1905.

WALKER AND WALLSEND UNION GAS COMPANY.

SALE BY TENDER OF £12,000 NEW FIVE PER CENT. PREFERENCE STOCK.

MINIMUM PRICE, £112 10s. PER CENT.

NOTICE is Hereby Given, that it is the intention of the Directors of the Walker and Wallsend Union Gas Company to SELL BY TENDER to be received at the Company's Office, Neptune Road, Wallsend-on-Tyne, not later than Ten o'clock on the morning of Friday, the 9th day of June, 1905, TWELVE THOUSAND POUNDS OF NEW FIVE PER CENT. PREFERENCE STOCK of the Company.

The Stock now for sale is a first issue of Preference Stock, which will be sold and issued in accordance with the provisions of the "Walker and Wallsend Union Gas Act, 1903."

Any amount of stock in multiples of £1 may be applied for. The Stock will be allotted to the highest Tenderers; but no Tender will be accepted at a lower price than at the rate of £121 10s. for each £100.

The quantity of gas sold by the Company during the past Seven Years has increased from 137,979,000 cubic feet in 1897 to 247,661,056 cubic feet in 1904—a total increase of 79½ per cent. The increase for 1904 over the previous Year was 34,297,782 cubic feet—an increase of 16·07 per cent. for the Year.

The number of Consumers during 1904 was increased by 3111.

Particulars and Conditions, with Forms of Tender, can be obtained from the undersigned.

By order,
CHAS. H. ARMSTRONG,
Secretary.

Offices: Neptune Road, Wallsend-on-Tyne,
May 12, 1905.

By order of the Directors of the

TONBRIDGE WATER-WORKS COMPANY, LIMITED.

NEW ISSUE OF 300 £5 "C" SHARES.

Ranking for a maximum Dividend of 7 per cent.; previous issues of similar Shares now receiving £6 6s. 8d. per cent.

MESSRS. MARTIN & SANDERSON will SELL the above by PUBLIC AUCTION, at the Rose and Crown Hotel, Tonbridge, on Tuesday, June 6, at Three o'clock precisely, in 35 Lots.

Particulars of the AUCTIONEERS, 174, High Street, TONBRIDGE.

ISSUES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MR. ALFRED RICHARDS begs to notify that his ISSUES by AUCTION under PARLIAMENTARY POWERS of STOCKS and SHARES in LONDON, SUBURBAN, and PROVINCIAL GAS and WATER COMPANIES take place PERIODICALLY at the Mart, TOKENHOUSE YARD, E.C.

Terms for Issuing such Capital, and also for including Gas and Water Stocks and Shares belonging to Private Owners in these Periodical Sales, can be obtained on application at MR. ALFRED RICHARDS' OFFICES, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

GRAYS GAS COMPANY, LIMITED.

NEW ISSUE OF 600 £10 "B" SHARES.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 20, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

SOUTHEND WATER-WORKS COMPANY.

NEW ISSUE OF 2100 NEW ORDINARY FIVE PER CENT. MAXIMUM £10 SHARES.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, Tokenhouse Yard, E.C., on Tuesday, June 20, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

GREAT YARMOUTH WATER-WORKS COMPANY.

NEW ISSUE OF 200 £10 ORDINARY SHARES AND £3000 FOUR PER CENT. PERPETUAL DEBENTURE STOCK.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 20, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

CHELSEA WATER-WORKS COMPANY.

(IN LIQUIDATION).

NOTICE is Hereby Given, that a GENERAL MEETING of the Governor and Company of Chelsea Water-Works, will be held at 41, Commercial Road, Pimlico, in the County of London, on Thursday, the 22nd of June proximo, at One o'clock p.m., for the purpose of confirming the payment of Dividend on the 5th of January, 1905, and of giving authority to the Directors as Liquidators of the Company to distribute by way of Dividend such amounts as may hereafter be found to be available for distribution; electing three Directors in place of

Francis Stephen Clayton, Esq.,
Alexander Ward, Esq., and
Herbert Peter Bodkin, Esq.,

the three Directors who retire by rotation, but who offer themselves for re-election, and an Auditor in place of

James Alfred Hallett, Esq.,

the Auditor retiring by rotation, but who offers himself for re-election; and for other business.

By order,
G. H. GILL,
Secretary.

London, May 25, 1905.

THE INSTITUTION OF GAS ENGINEERS.

See CLAPHAM'S PATENT
"ECLIPSE"
REVERSIBLE
CONDENSERS
Erected at the
"NEW GLYNE GAP WORKS"
OF THE
HASTINGS & ST. LEONARDS GAS CO.
MAKERS:
CLAPHAM BROS., LTD,
KEIGHLEY, YORKS.

PRICE'S COKE & COAL BARROW

effects a great saving of time, labour, and expense.

For Particulars, Price, &c., apply to Mr. EDWARD PRICE, "Langley," Wyke Avenue, WORTHING.

TROTTER, HAINES, & CORBETT,
BRETTELL'S ESTATE LIMITED,
FIRE-CLAY & BRICK WORKS,
STOURBRIDGE.

Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS

Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.

SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

LONDON OFFICE: R. CULL, 34, OLD BROAD STREET, E.C.

HEATHCOTE GAS COAL.

Rich in Illuminating Power and yield of Gas.

Above the Average in Weight and Quality of Coke.

Maintains a High Standard in Residuals.

THE GRASSMOOR CO., LD.,
CHESTERFIELD.

THE
"ROTARY"
STATION METER.

Efficiency Demonstrated.

APPLY—
T. G. MARSH,
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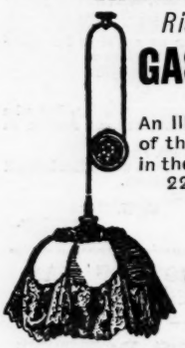
MANCHESTER.

THE "HANWELL" PATENT
Rising and Falling
GAS PENDANT



An Illustrated Description of this Pendant appeared in the "Journal" for Nov. 22, 1904 (page 599).

Write for full Particulars to the "HANWELL" Pendant Company,
96, ABINGTON STREET, NORTHAMPTON.

GILBERT LITTLE & CO. LTD.
Conveyor and Elevator Specialists,
Smethwick, Birmingham.
Make known your wants for Conveyors and Elevators to GILBERT LITTLE, the Pioneer Specialist: he will supply them.

THOMAS DUXBURY & CO.,
16, DEANSGATE, MANCHESTER,
Gas Engineers' Agents and Contractors for METERS, FIRE-CLAY GOODS, OXIDE OF IRON, AND ALL OTHER GAS APPARATUS.
Inquiries Solicited.
Telegrams: "DARWINIAN, MANCHESTER."
Telephone 1806.

NEWBATTLE CANNEL.
Highest Results in Gas, & Excellent Coke.

QUOTATIONS ON APPLICATION TO
THE LOTHIAN COAL COMPANY,
LIMITED,
NEWBATTLE COLLIERIES,
DALKEITH, N.B.

Gas Companies are solicited to try Samples of the
MIRFIELD GAS COAL
UNEQUALLED.
Sperm Value 878·85 lbs. per Ton.

Prices and analysis on application.
The MIRFIELD (GAS-COAL) COLLIERIES CO.,
RAVENSTHORPE, NEAR DEWSBURY.

RAILS.
New and Second-Hand with all Accessories; also Tip Waggons and Turntables.

B. M. RENTON,
MIDLAND WORKS,
SHEFFIELD.

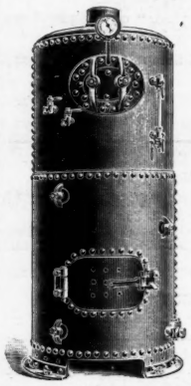
JAMES OAKES & CO.,
ALFRETON IRON-WORKS, DERBYSHIRE,
AND
Wenlock Iron Wharf, 21 & 22, Wharf Road,
CITY ROAD, LONDON, N.

Manufacture and keep in Stock at their Works (also large Stock in London)

PIPES and CONNECTIONS, 1½ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS, and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

NOTE.—Makers of HORSLEY'S PATENT SYPHONS. These are cast in one piece, without Chaplets; doing away with Bolts, Nuts, and Covers, and rendering Leakage impossible.

THE
Grantham Crank & Iron Co., Ld.
GRANTHAM.



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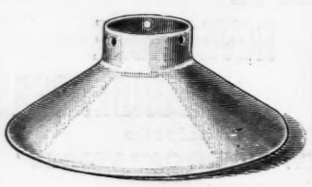
STEAM BOILERS
(of all types and powers).

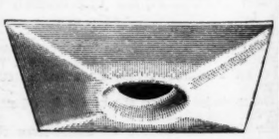
Vertical, Loco, Cornish, and Lancashire.

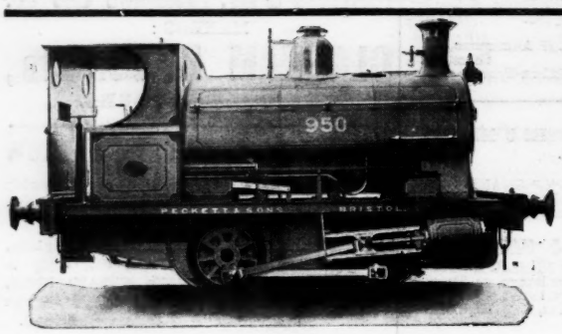
FEED-WATER HEATERS.
VERTICAL ENGINES.

THOMAS TURTON AND SONS, LIMITED,
SHEAF WORKS, SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS.
STEEL OF ALL DESCRIPTIONS.
SCREW STOCKS, TAPS AND DIES,
SPANNERS, RATCHET BRACES, LIFTING JACKS,
ANVILS, VICES,
AND ENGINEERS' TOOLS GENERALLY,
LONDON OFFICE:
90, CANNON STREET, E.C.



JOHN WOOD & CO., LTD.,
STEPNEY POTTERY, NEWCASTLE-ON-TYNE,
MANUFACTURERS OF
White Earthenware **Cones and Reflectors**
for Street Lamps and Shop Lights
of various kinds.





LOCOMOTIVES

LOCOMOTIVES of all Sizes and Gauges specially constructed for Main and Branch Lines, Contractors, Docks, Gas-Works, Collieries, Iron-Works, Brick and Cement Works, &c. Locomotives of various Sizes always in Stock, ready for immediate delivery.

Photographs, Specifications, and Prices on Application.

PECKETT & SONS, Atlas Locomotive Works, **BRISTOL.**

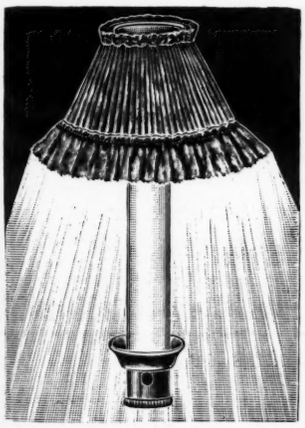
Telegraphic Address: "PECKETT, BRISTOL."

BOWENS' Ltd. Successors,
STOURBRIDGE.

MANUFACTURERS OF
BEST FIRE-BRICKS; INCLINED, HORIZONTAL, and SECTIONAL RETORTS; LUMPS, TILES, &c., of every description.
ESTABLISHED 1860.

WILSON CARTER & PEARSON
LIMITED,
GAS COAL AND CANNEL FACTORS,
Supply to any Railway Station, or for Export, all kinds of Fuel for Gas and Other Purposes.
ADDRESS CHIEF OFFICES:
Temple Buildings, 50, New Street, Birmingham.

THE THAMES BANK IRON CO.
UPPER GROUND STREET, LONDON, S.E.
SUPPLY FROM STOCK
CAST-IRON RETORTS
AND ALL KINDS OF GAS-WORKS APPARATUS.
SOCKET-PIPES FOR GAS OR WATER PURPOSES.
FLANGE PIPES FOR STEAM.
Sole Manufacturers of **LYON'S "PATENT" GAS-MAIN SYPHONS.**
AGENTS FOR
ATTERTON'S PATENT APPARATUS for CHARGING RETORTS.



Patent applied for. Registered.

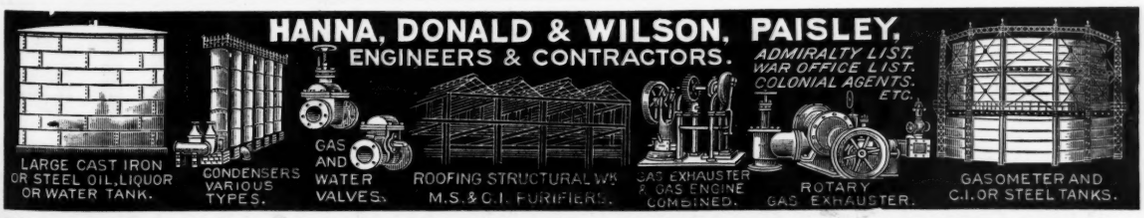
GREAT NOVELTY
THE
'ROYAL' INCANDESCENT GAS-LIGHT CANDLE.
The most decorative Gas-Light ever offered.
A perfect combustion Burner.
Cannot get out of order.
60-Candle Power with 2½ cubic feet of Gas.
Can be used anywhere instead of a "C" Burner.
Address of your nearest Wholesale Factor will be sent on application to No. 4374, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

Registered Offices:
Adjoining Lye Station, G.W. Railway.
Telegrams:
"Harrison, Lye."

GEORGE K. HARRISON.
LIMITED,
Proprietors of
STOURBRIDGE FIRE-CLAY MINES, BRICK WORKS, & COLLIERIES,
STOURBRIDGE.
Works, Collieries, and Mines:
BRETTELL LANE, NAGERSFIELD, and LYE.

MECHANICAL COAL HANDLING PLANTS
OF ANY MAGNITUDE
MADE AND ERECTED
BY
GIBBONS
BROTHERS
LTD
DUDLEY & LONDON

HANNA, DONALD & WILSON, PAISLEY,
ENGINEERS & CONTRACTORS.
ADMIRALTY LIST.
WAR OFFICE LIST.
COLONIAL AGENTS.
ETC.


LARGE CAST IRON OR STEEL OIL, LIQUOR OR WATER TANK.
CONDENSERS VARIOUS TYPES.
GAS AND WATER VALVES.
ROOFING STRUCTURAL WK M.S. & C.I. PURIFIERS.
GAS EXHAUSTER & GAS ENGINE COMBINED.
ROTARY GAS EXHAUSTER.
GASOMETER AND C.I. OR STEEL TANKS.

HISLOP'S PATENT RETORT SETTINGS.
The very best to adopt for Productive Capacity, Economy of Fuel, Durability, and Simplicity of Management.
R. & G. HISLOP, Gas Engineers and Contractors, PAISLEY, N.B.
LONDON: 11, QUEEN VICTORIA STREET, E.C.

GAS METERS.
SLOT METERS.
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FITTINGS.

CENTRAL WORKS in DESSAU
OF THE
GERMAN CONTINENTAL GAS ASSOCIATION
(Deutsche Continental Gas Gesellschaft).
For Illustrated Price Lists and full Particulars apply to our SOLE AGENTS FOR THE UNITED KINGDOM AND COLONIES:
THE INCANDESCENT LIGHTING & MANTLE INSURANCE CO.,
57/58, CHANCERY LANE, LONDON, W.C.
Telephone: 12788 CENTRAL. Telegrams: "FRAENKL, 58, CHANCERY LANE."

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VERY FREE FROM IMPURITIES.
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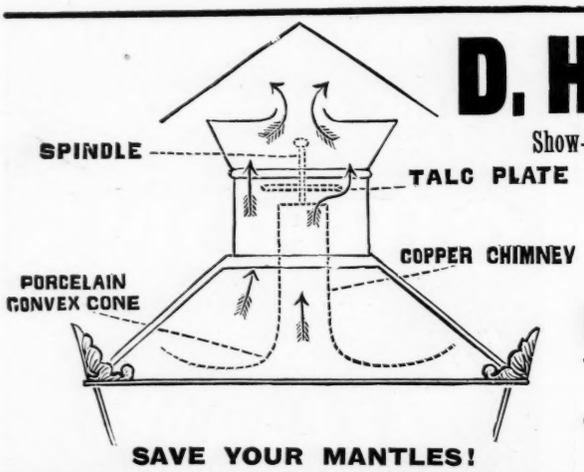

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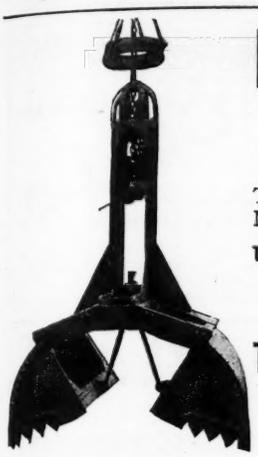

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Automatic, Efficient, & Economical.

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These Grabs are unequalled for handling Coal, Coke, Ballast, Sand, Macadam, Ores, &c., effecting in all cases very substantial savings.

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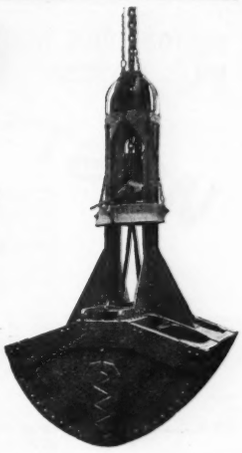

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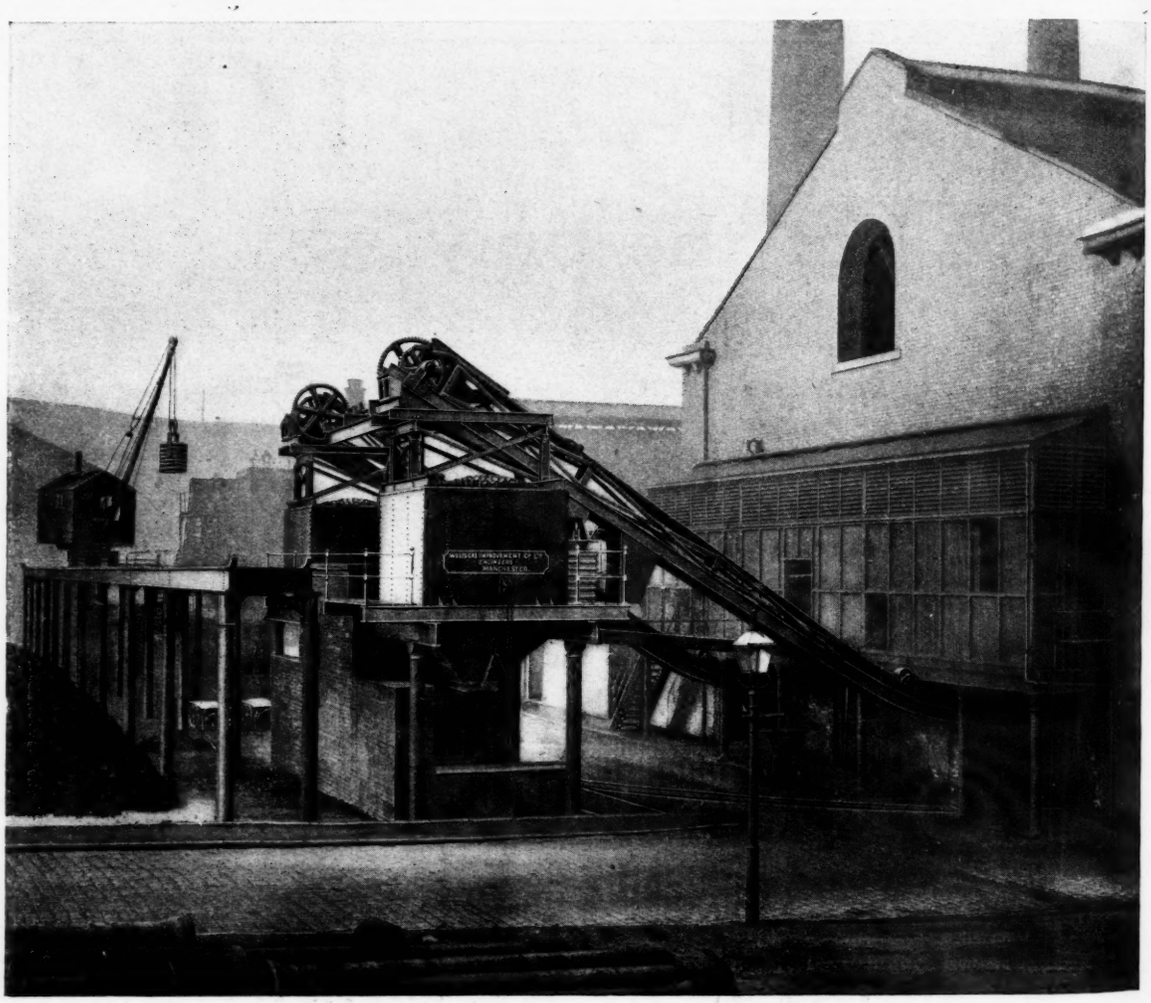

Photograph showing West's Coke-Conveyor dealing with the Coke from Nineteen Through Beds of Retorts.

WEST'S IMPROVED PATENT HOT-COKE CONVEYOR,

With Special Chain constructed with a minimum number of parts, and having Large Joint Pins with ample Bearing Surfaces.

WEST'S STOKING MACHINERY— COMPRESSED AIR DRIVEN AND MANUAL SYSTEMS.

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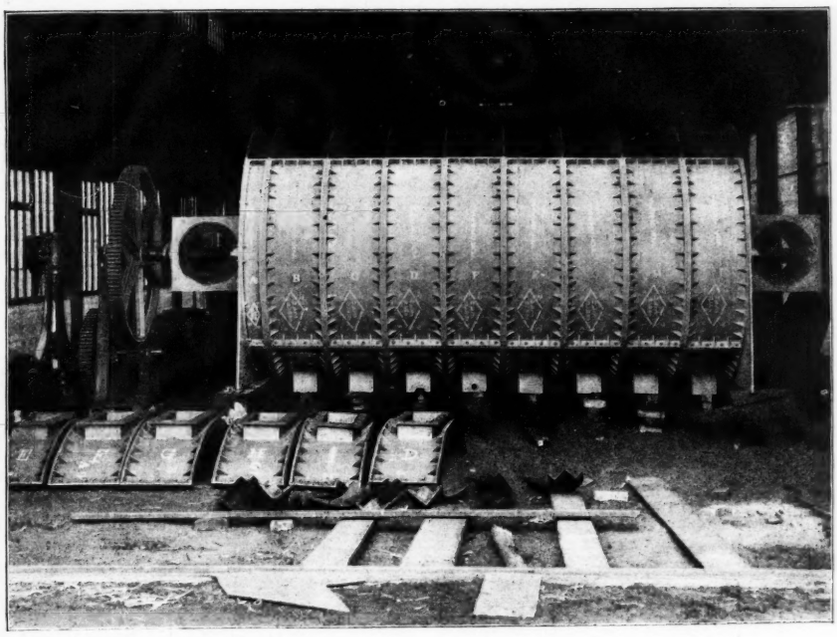

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"Whessoe" Rotary Washer-Scrubber (H. Kirkham & Chandler's patent). **Capacity 1,500,000 Cub. ft. per diem.**
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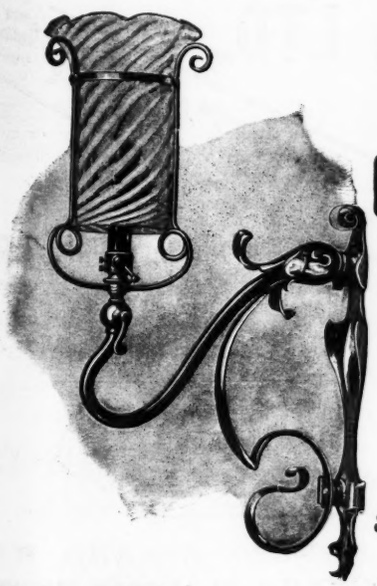

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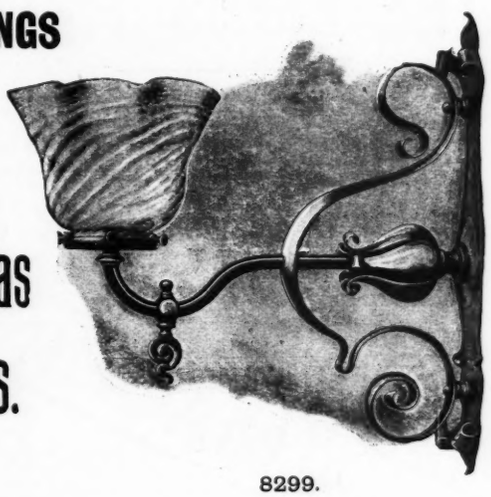
FOR

Ordinary and Incandescent Gas Burners.



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PREPAYMENT METERS for Pennies, Shillings, or any other Coin.

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BLUE WATER GAS, CARBURETTED WATER GAS.

COMBINED WITH
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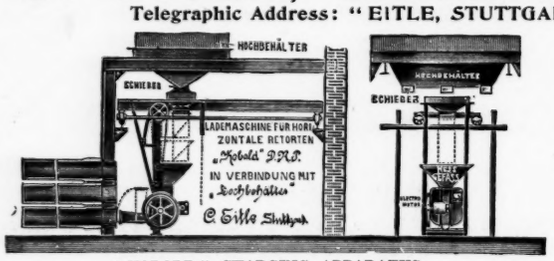
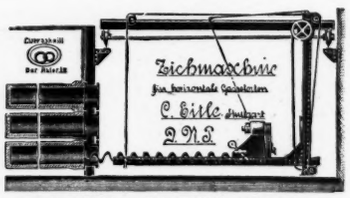


"KOBOLD" CHARGING APPARATUS.



"SCHLANGE" DRAWING MACHINE

ADVANTAGES OF THE "KOBOLD" CHARGING APPARATUS.

1.—The simplest of all existing Charging Machines, as in charging there is only ONE shaft working.
2.—Almost indestructible in construction, as there are no combustible parts exposed to the heat of the Retorts.
3.—Uniform bed of coal of any desired height in the retort, and consequently any desired weight of charge may be inserted.
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5.—Least inrush of cold air owing to the close fit of the charging mouthpiece with the retort mouthpiece, with consequently practically no cooling of the retort, the least outrush of flame and smoke, and therefore smallest loss of gas.
6.—Smallest consumption of power.
7.—Most rapid working, as the complete charging of a retort requires only two pulls of a lever.
8.—May be set at any position in regard to height by either manual or motor power.
9.—Lowest cost to purchase; paying interest and redemption in about three years.

ADVANTAGES OF THE "SCHLANGE" DRAWING MACHINE.

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CLIFF'S BRAND.
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Fire-Bricks, Lumps, Tiles, &c., &c., of every description suitable for Gas-Works.

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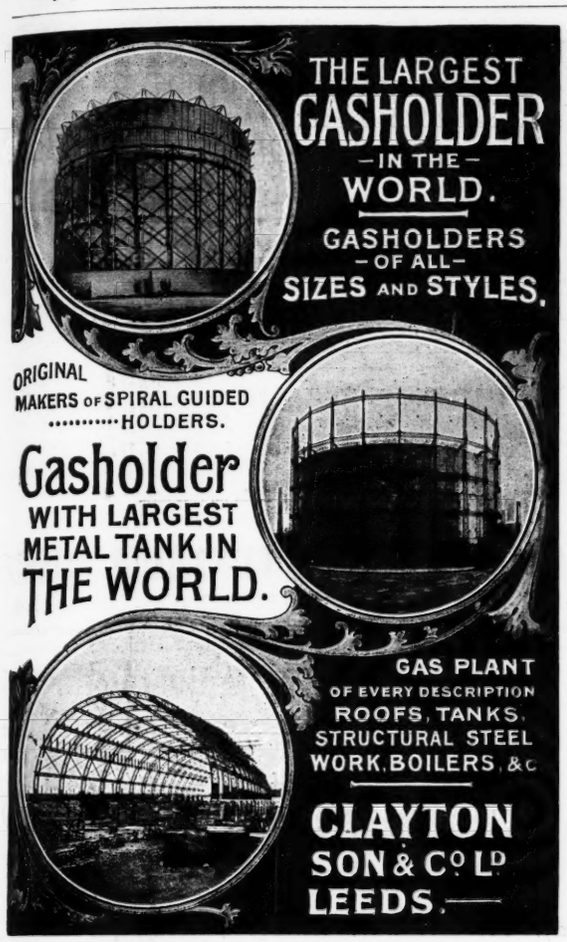

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GASHOLDERS —OF ALL— SIZES AND STYLES.

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Gasholder WITH LARGEST METAL TANK IN THE WORLD.

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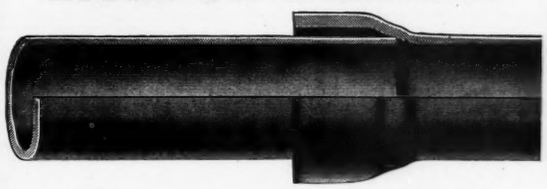

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In any Length up to 40 feet for GAS & WATER MAINS.

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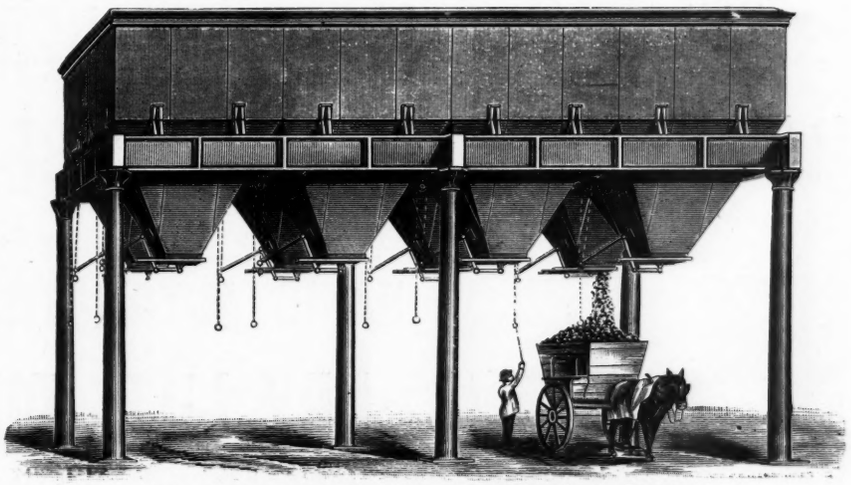

Coke Storage, Elevators, Conveyors, Breakers, Screens.

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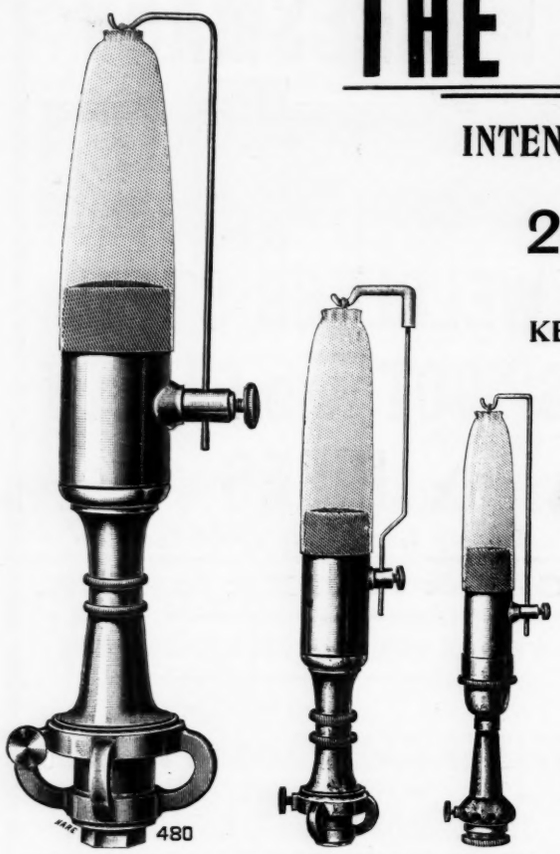

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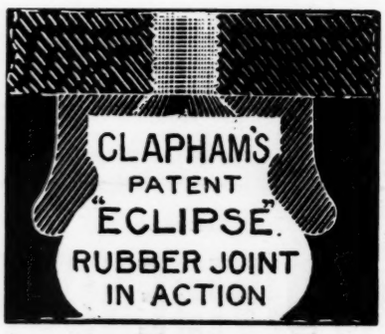

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